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THE AGE-OLD OAKS

WHENCE have they come for assemblage, the age-old oaks? It may be that they have stepped out from the Hall of Fame trees of the American Forestry Association. It may be that they have some secret modes of communication, a language not audible, yet built up through the centuries in potency. There they are, the oaks that have sheltered armies, in their victorious marches for the changing of human destiny, the oaks that have nourished the heroes of the world's fame and fortune, the oaks that have stood by and witnessed the march of human progress and the rise and fall of dynasties, the evolution and extinction of types of civilization. They come from many lands weighted with years. They are the

are in caucus to pass upon the tyranny of force over forest, of industry over natural existence, of the factory over the forest. They are there to tell the story of Olympus, and to recite the glories of a Hellenic age. They are there to tell of the symbolized sculptures of the Greeks and the far-faring ships of the Phoenicians. They are there in assemblage to plead for what, to plead for the rights of all trees, for the dignity of age and ornament against vulgar use; to plead for the streams dried up through the slaughter of the cloud-wooling trees; to plead for the mountains left bare by the double-edged axes of the wood choppers; to plead for the rights of the soil, that it shall not be made bare and waste and desolate; to plead for



Before Basking Ridge took its place in the world this Oak stood there. The people of this New Jersey town can trace the tree's history for four hundred years, but the church is only two hundred years old. It has just celebrated that event. Miss Margaret S. Hitchcock, of Morristown, and Mrs. William D. Baneker, of Basking Ridge, nominate the tree for a place in the Hall of Fame which the American Forestry Association is compiling of trees with a history. The tree has a circumference of fifteen and a half feet six feet above the ground, and what a history it could tell could it but speak of the people who have come and gone from that old church it guards so well.

oaks of a thousand years ago. They are styled oaks, for the concreteness of the title, but in the assembly of the giant oaks are found the cedars of Lebanon and those mighty trees of California that have stood where they now are amid earthquake and shock for ages, unaffected. There are the oaks of the Druids from the morass of Ely. There is the old Charter Oak and oh, so many others, wedded to the rich facts of history. They are the oaks that have been twined with mistletoe for ages past, amid whose branches the orchids have found sheltering, to flaunt their gaudy blossoms to the high winds.

The assembly of the age-old oaks, what does it mean? Peruse the program upon the smooth birch bark—they

climate against material conquest; to plead for the preservation and expansion of the mighty arboreal reaches in which so many veterans have held their undisputed sway through ages past.

The age-old oaks are aroused and protesting. Let the iconoclast beware, for as sure as day follows night, so does desolation follow in the wake of desecration. So do there come to pass the conditions of dearth and decay, with material benefits languishing, when nature is violated and the mighty forests stripped and the lands given over to the fabrication instead of fruition. Let the oaks be heard and their protests heeded!—Reprinted from the Baltimore American.

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EDITORIAL

FOREST PROGRAM REACHES CONGRESS

ON December 22, 1920, Congressman Snell, of New York, introduced in the House of Representatives a bill (H. R. 15, 327) "to provide through co-operation between the Federal Government, the States, and owners of timberlands for adequate protection against forest fires, for reforestation of denuded lands, for obtaining essential information in regard to timber and timberlands, for extension of the National Forests, and for other purposes, all essential to continuous forest production on lands entirely suitable therefor." This bill aims to put into effect the so-called "coalition forest program" agreed upon last fall by representatives of the American Forestry Association, lumber and wood-using industries, and others, and more recently endorsed by the Western Forestry and Conservation Association and the California White and Sugar Pine Association.

Congressman Snell's bill aims at two main objects,—the development with Federal co-operation and financial assistance of adequate forest fire protection and forest renewal in the various States, and the material extension of Federal forest ownership and production. In order to secure the first of these objects the Secretary of Agriculture is authorized and directed to recommend for each forest region the requirements essential for the protection and continuous production of timber on timbered and cut-over lands, to co-operate with the various States in bringing such requirements into effect, and to make a survey of the forest resources of the United States. The sum of \$2,000,000 is provided for these purposes of which not less than \$1,000,000 is to be used exclusively for forest protection and renewal in co-operation with the States. Such co-operation is to be contingent on at least equal expenditures by the States and the Secretary of Agriculture is authorized to withhold co-operation

from any State which does not comply in legislation or administrative practice with the requirements which he may determine to be essential.

As a means of achieving the second object, the acquisition by the Federal Government of lands chiefly suitable for forest production, irrespective of whether or not they are on the watersheds of navigable rivers, is provided for, with an appropriation of \$10,000,000 a year for five years. Provision is also made for the extension of the National Forests by the acquirement of forest lands not now owned by the Federal Government in exchange for equal values of National Forest land or timber or assignable certificates for timber; and \$250,000 a year is proposed for the classification of all federally owned lands not now embraced in the National Forests or National Parks, with a view to the inclusion of those chiefly valuable for timber production or watershed protection within the National Forests. Finally, provision is made for forest research of all kinds, including the establishment of experiment stations, by an appropriation of \$1,000,000 a year, and a similar amount is provided for the establishment of forest nurseries and the sowing and planting of denuded lands within the National Forests.

A comprehensive forest program representing the views of a wide variety of interests has thus reached the stage of pending legislation. A National Forestry Program Committee has been organized to push the measure and every effort will be made to secure favorable action at the earliest possible date. The passage of the proposed legislation would mark a tremendous advance in the handling of our forest problems. It deserves and should receive the active support of every citizen sincerely interested in the perpetuation of our forest resources.

TWENTY YEARS OF SERVICE

AN event of more than usual significance in the forestry world was the recent celebration by the alumni of the Yale Forest School of the twentieth anniversary of the founding of the School. The meeting was unique in two important respects—it commemorated twenty years of service on the part of the oldest forest school in continuous operation in this country, and it brought together more professional foresters than have ever before been assembled in one place. Nearly 100 alumni, or approximately 20 per cent of the total number, returned to

New Haven to renew old friendships, to learn first hand of the progress made by their alma mater during the decade since the last reunion, and to pledge their support in helping the School to realize its plans for a still greater future.

The importance to the country as a whole of a body of professional foresters such as that represented at the Yale reunion is difficult to overestimate. Americans as a class have been slow to realize the benefits of professional training for public service and to take ade-

quate steps to secure thoroughly trained men. So far as our forest resources are concerned, however, the public is awakening to the necessity of stopping the present forest destruction and waste which affect the welfare and comfort of every citizen in the land. The average man knows that something must be done about it but gropes in the dark when it comes to mapping out and executing an adequate policy for correcting these conditions and restoring our forests. The trained forester knows what to do and has repeatedly proved his ability to do it. Upon him depends in large measure the future of our forests—National, State, and private. The success or failure of America in the next two decades to solve the problem of its vanishing timber supplies will be determined by the extent to which professionally trained foresters are given the opportunities to work out our forest problems on the ground in direct contact with the forces of nature.

The Yale Forest School has set an enviable record in the character and ability of the alumni whom it has sent

forth. Of the 518 men who have received professional training at the School, nearly 400 have received the degree of Master of Forestry, this represents approximately two-thirds of the total number of such degrees granted by all the forest schools in the country. These men have risen to positions of leadership in National, State, and private forestry, and, perhaps, more conspicuously still in forest education. Their devotion to public service in all of its many aspects has been most pronounced and their influence has been widely felt.

This record of past service rendered carries with it an obligation and a responsibility for the future. It is safe to say that the Yale School of Forestry enters on its third decade with a full realization of the work to be done and of its opportunity for further service. All those interested in the progress of forestry will share the hope that it may continue to prosper and to maintain the high standards set during the first twenty years of its existence.

A VOICE FROM NEW ENGLAND

IN view of New England's traditional reputation for conservatism the following extract from the latest annual report of the Commissioner of Forestry of Rhode Island is of particular interest:

"I am in favor of states rights, and private rights and interests, so long as these are consonant with natural equity and the general welfare. I naturally disfavor a mandatory program in forestry. Nevertheless, some form of governmental control of privately-owned forest lands may eventually prove to be a matter of dire necessity, unless private owners soon take an active part in forest conservation. Indifference, ignorance, inaction, and long delay spell the destruction and wasteful exploitation of our valuable natural resources. The time is

come when destructive lumbering should cease. Timber lands should no longer be cut-over without any reference to future reproduction. As a man has no business to maintain a common nuisance, no more has he a right to handle his forest property to the detriment of his neighbors and of the town and State."

This is the case in a nutshell. The logic of events points irresistibly to the absolute necessity for the conservation of one of our most valuable natural resources. If private owners do not take the initiative, the States and the nation will. The ideal solution lies in the adoption of a constructive program based on the harmonious cooperation of all three agencies.

PULP AND PAPER INDUSTRY TALKS FORESTRY

EVIDENCE from several different sources bears striking testimony to the steadily increasing desire on the part of the pulp and paper industry to take such steps as may be necessary to assure an indefinite supply of raw material. This is true both in the United States and Canada, although it must be admitted that at present our Canadian friends are somewhat in the lead. This was rather strikingly brought out at the meeting of the Woodlands Section of the Canadian Paper and Pulp Association in Toronto in December. At this meeting, which was widely attended by timberland owners, woods operators, and pulp and paper manufacturers, the practice of forestry was the chief topic of discussion. It is safe to say that no two-day session of the representatives of any wood-using industry was ever before held on this continent which was devoted almost exclusively to the earnest and even enthusiastic consideration of technical forest problems.

No one attending this meeting could fail to be impressed by the very evident desire on the part of those

present to handle their forests in such a way as to secure the maximum utilization of pulp wood with a minimum of waste, and at the same time to insure the perpetuation of the forest. Such strictly technical subjects as the best silvicultural systems to use under various forest conditions, the rate of growth and yield of even and uneven-aged stands, and the loss of trees through suppression and decay, were discussed not only intelligently but even in the vernacular of the forester. Natural reproduction versus planting as the best method of securing a new stand was taken up at considerable length, with reference not only to costs but to the final results secured. The meeting brought out the fact that practically all of the companies represented are carrying on independent investigations in an attempt to secure information of value to them. These experiments are for the most part on a big scale, often including thousands of acres, and show that the Canadians are really in earnest in their attempt to save their timber supply before it is too late.

In the United States the pulp and paper industry has

also been among the first of the wood-users to recognize the fact that a permanent and adequate supply of raw material for the maintenance of the industry can be secured only by the practice of forestry. More technically trained foresters have probably been employed in the pulp and paper industry than in any other phase of private forest work, and the industry has, as is well known, been active in urging the adoption by the Nation of a comprehensive forest policy. At the annual meeting of the American Paper and Pulp Association, in November, arrangements were made for the organization of a woodlands section similar to the section already in existence in the Canadian Association. It is to be hoped that this new section will be as aggressive and effective as its Canadian counterpart, and that it will be successful in arousing an equally keen and intelligent interest in the entire problem of forest management. That this is likely to be the case is indicated by the vision expressed by many of those at the November meeting of the American Association of the day when their pulp mills will be in the midst of well-forested areas

so handled as to produce a sustained annual yield.

One of the reasons for the early recognition by the pulp and paper industry of its dependence upon a perpetual supply of timber has been its heavy capital investment in manufacturing plants. These must obviously be kept supplied with raw material if the owners are not to suffer heavy loss. It must not be overlooked, however, that this same situation exists, although in many instances to a lesser extent, in the case of other wood-using industries. All of these have made a larger or smaller investment which can be safeguarded and on which heavy depreciation charges can be avoided only by continuous operation. And from the broader standpoint of the community as a whole the continuation of the wood-using industries and of the opportunities for the employment of labor and capital which they offer is essential to their economic welfare. Let us hope that it will not be long before these facts are more widely recognized and before the interest in the forest problem now manifested by the pulp and paper industry becomes general.

TRIBUTE TO A GREAT LEADER

A WELL-DESERVED tribute to one of the great leaders of forestry in America was paid by the Second National Conference on Education in Forestry and by the Society of American Foresters at their meetings the latter part of December. Both organizations sent to Dr. B. E. Fernow telegrams regretting his absence from their deliberations and expressing their affection for him as a man and their appreciation of his services as the dean of forest education and the nestor of forestry in North America. No man is more worthy of such recognition.

For forty years Dr. Fernow has rendered marked service to forestry in America as organizer, administrator, and educator. From the very beginning he has been a pioneer and a trail-breaker. As far back as 1882 he was one of the organizers of the American Forestry Association. A few years later he organized the Division of Forestry

in the United States Department of Agriculture, which he left in 1898 to organize the first professional forest school in the country—the New York State College of Forestry, Cornell University. Nine years later, in 1907, he organized the first forest school in the Dominion of Canada at the University of Toronto. In practically every part of the broad field of forestry his leadership has been conspicuous and effective.

Few men have either the opportunity or the ability to render such conspicuous service as has fallen to Dr. Fernow's lot. All those who have the true interests of forestry at heart will echo the hope of the Society of American Foresters that he "will continue for many years to come to be the inspiration and leading spirit as you have been in the past for the profession of forestry in America."

INEFFICIENT ECONOMY

THE action so far taken by Congress on the various appropriation bills indicates that early reports as to its determination to cut all appropriation estimates to the bone were well founded. It is to be hoped that this zeal to economize in governmental expenditures may be tempered by some degree of judgment and that discrimination will be exercised in making such cuts as appear unavoidable where they will do the least harm. In the case of the Forest Service, for example, the increased appropriation of approximately \$2,700,000 requested by the Secretary of Agriculture is absolutely essential for its effective functioning. For Congress to materially reduce the amount asked for would seriously cripple some of the most important activities of the Service and in the long run would prove the most inefficient kind of economy.

Most important of all is the readjustment of the present statutory roll and the provision of sufficient funds for the miscellaneous roll to make possible the payment of reasonably adequate salaries. Under present conditions it is impossible for the Service to retain its trained personnel, and the resulting turnover is demoralizing.

In addition to provision for adequate salaries, funds are also much needed for the extension of important Forest Service activities. Largely increased amounts are urgently needed for the protection of the National Forests from fire. The appropriation of a million dollars which the Secretary of Agriculture has requested in a supplemental estimate, with the approval of the President, for co-operation with the States in forest fire protection and other phases of forest management, would be one of the best paying investments that the country could make.

THE TIMBER SUPPLY AND WHAT TO DO ABOUT IT

BY ROY HEADLEY

THE average citizen remembers that there was a good deal said about conservation a few years ago, and he has a hazy idea that there are National Forests somewhere in the West. He sees an occasional magazine article describing recreational features of the National Forests, and occasionally reads about forest fires being fought. These impressions leave Mr. Average Citizen with the idea that the timber supply of the country has been pretty well provided for.

He is more willing to let it go at that because it has always been something of an effort for him to whip his mind into a state of real concern over the threatened timber shortage about which the foresters have always talked so much. Try as he would, he could never feel sure that the approaching timber shortage meant much to him personally, or that it laid on him any particular obligation for action.

Why is it that Mr. Average Citizen takes this rather complaisant attitude in the face of the steady flow of information and argument designed to make clear to the general public the oncoming national timber shortage, which is so well known to lumbermen and foresters?

As a nation we have just emerged from the period when timber was a good deal of a nuisance—an obstacle in the road to progress and prosperity for the settler, the road builder, and the stock grower. It has been but a few years since, in certain parts of the country, trees were still killed by girdling in order that virgin timber land might be turned into cultivated fields. Log rollings, at which beautiful, straight, clean logs were heaped in giant piles and burned, have been familiar sights to men not yet old. In the good old days when walnut, or pine, or oak was cut and burned at a great expenditure of labor in order that the land might be cleared and farmed, there was no market for the timber on the land, even though it was composed of the choicest species and grades. The only course left open to the aggressive settler was to cut and burn and destroy.

After thinking for generations that timber exists in inexhaustible quantities and must often be destroyed in order that agriculture and home building may go on, the average man has been asked to revolutionize his point of view and think of timber as a natural resource which is rapidly vanishing to the great detriment of our individual and national prosperity and comfort. He simply has to have time for this reconstruction of opinion. He has not, as yet, quite recognized that we have completed the transition from the days of too much timber to the days of too little timber.

It is less than twenty years ago that shrewd, hard-headed lumbermen, who had actually seen the successive exhaustion of timber supply of the western and middle western states, refused an opportunity to invest in the splendid stands of western white pine in Idaho. Their reason was that the present and future lumber

markets were too far distant to make the manufacture in quantity of this lumber a profitable enterprise. These men had seen the lumber industry migrate from Maine to Pennsylvania, thence to Michigan and Wisconsin, and they knew it would be only a matter of time until the corporations then doing a flourishing business in Minnesota would be forced to seek fresh stands of virgin timber; but even with the advantage of all this significant experience they could not believe that the lumber supply lying east of the plains region would ever fall far enough short of the demand to make it possible for Idaho lumber, with its handicap of high freight charges, to compete seriously for the markets of the west and middle west.

Where majestic forests of western white pine stood when these lumbermen rejected what later proved to be a golden business opportunity is now to be found an increasing area of blackened waste left in the rear of lumbering operations that have prospered by shipping to those identical markets east of the Rockies. Idaho timber was required to meet the growing demand for lumber in the middle west and east, and its manufacture and export has given rise to a flourishing lumber industry.

If shrewd lumbermen with the advantage of life-long familiarity with the process of progressive timber depletion guessed so far wrong on the speed with which timber then inaccessible would be reached in the devastating march of the lumber industry from the east to the west, it is little wonder that the average man, with his lack of expert information, should fail to recognize that the days of plenty of timber have passed and the days of shortage are upon us.

The tragedy of the situation is, that by the time public opinion becomes fully aware of the fact of timber depletion, many golden opportunities to prevent depletion by easy and natural means will have been lost.

Michigan is beginning to realize the meaning of the ten million acres in that state that have been made a desert by unwise lumbering and fire, and many people are convinced at last that these wastes can not be made into farms; they recognize that the humus has been burned out of the soil and that only the burned sand is left. They recognize what an asset these millions of acres might now be to the state if they had been given proper care, but it is too late; such seed trees as were left after the land had been logged have gone down before repeated fires; the soil fertility has been terribly wasted even for tree growth, which is not as exacting as cultivated crops. In many localities tree growth can only be restored by costly artificial planting, and because of the carelessness with fire which has become so habitual, artificial planting is a hazardous venture—too hazardous for private owners who are unwilling to plant a crop which for decades must run the gauntlet of fire in

(Continued on page 116)



A PANORAMA OF THE FINEST TYPE OF SCENIC LAND SURROUNDS FOX LAKE ON THE BEARTOOTH

FOREST RECREATION DEPARTMENT

ARTHUR H. CARHART, EDITOR

THE LAND OF THE BEARTOOTH

BY FOREST OFFICERS OF THE BEARTOOTH NATIONAL FOREST

LITTLE imagination is necessary to conjure up the scene which probably surrounded the christening of Beartooth Mountain. The Crow tribe was moving into new hunting grounds. The white men had allotted them a last place to inhabit which after a fashion they could call their own. Picture the incident occurring on a bright fall morning when crisp frost made leaves rustle under horse hoof; or if you prefer think of the day as misty with only a glimpse of the mountains coming when between great soft clouds the wind tore rifts in the moist blanket, which hung on slope and crag. Perhaps as one such rent in the misty curtain

occurred the sun flashed brightly on the top of a great peak lifting its head far above the clouds at its foot. It was this first glimpse of the great mountain which so resembled a gigantic tooth of a bear that gave it the name. For the Crow Indians named the peak when they first came to this forest region and from the peak the range

and the National Forest get the name "Beartooth." No fame is broadcast which brings to all the knowledge that the Beartooth is a great national playground. Perhaps to this moment but few know of its existence, but those who have visited the delightful areas within this great scenic forest know it to be one of the most picturesque, one of the most

leasing of places to get a real outdoor vacation.

So, Mr. Citizen, meet your Beartooth National Forest.

The Beartooth is not a place for those who will take their vacation time listening to jazz bands every night. There are no bright lights in luxurious hotel lobbies nor



LIKE MYSTIC SHIPS THESE TINY ISLANDS SPRING FROM THE SURFACE OF ROCK ISLAND LAKE IN THE BEARTOOTH

dress suit to struggle with. The music that is there is of the wind skooting around snaggy rock-topped mountains or sifting through the tops of giant needle-clad trees. And the bright lights are from God's stars which shine like lustrous gems set in dark blue. And the suit that is proper dress is of flannel and khaki and leather,



PILOT AND INDEX MOUNTAINS LIFT LOFTY CROWNS ABOVE A LAND OF EXQUISITE BEAUTY. LOOKING ACROSS KERSEY LAKE INTO THIS WONDERLAND OF PEAKS AND LAKES

for here is a magnificent world of outdoor vacation country for the fellow who really wants to get into the open and see the real mountains and scenery which is untainted with man's so-called improvement.

Chronic travelers and amateur vacationists follow beaten paths. No better illustration can be found than the Beartooth country. A great stream of tourists annually goes into the Yellowstone country and passes on, but never in their visit to the region do these visitors learn of the Beartooth. Still this unusually interesting region is contiguous to the National Park. The traveler enroute westward, enters eastern Montana and going towards Billings, his first view of snow-capped mountains is of the Beartooth range. It is located south of the Yellowstone river and wholly in Montana and there awaits the most pleasing of vacations for one who will forsake beaten travel paths but a few miles and really taste of the outdoor life in an unspoiled country.

Not alone does this Forest serve as a place where the joy of play in the mountains may be had. It produces great economic values too, for each year 50,000 sheep range the meadows of the Forest and 5,000 cattle fatten from the forage picked in the tree-bordered parks. Annually 2,000 feet board measure of timber which goes into mining stulls, props and railroad ties are harvested from the Forest. And all of this use return and other uses are in addition to it being one of the ideal places of the west for a vacation. To really see the Beartooth one must go on pack trips. This means that

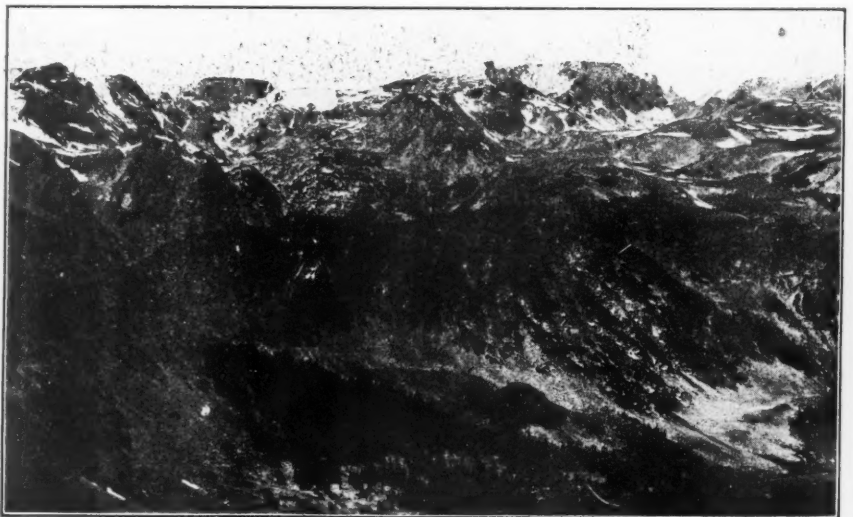
there is hard traveling and it may be that it will keep many from viewing the scenic splendor within the borders of the Forest. But there are other places where one may go with an automobile or wagon and still get the opportunity to enjoy some of the recreation found here.

Just a few miles out from Red Lodge, Montana, on the West Fork of Rock Creek, there are some excellent camp sites. Here, too, is Camp Senia, a well organized resort prepared to take care of the traveler. Compared to a long trip with pack outfit, this trip is easy, but for eight miles from Red Lodge the way is over a wagon road and the last four miles of the trip to the

camp site must be taken on a saddle horse.

Established at this camp, the scenic features of the immediate neighborhood can be reached and ten days is little enough time to spend here. Trips can be made to Silver Run Mountain, to Bow Back Mountain, to Red Lodge Creek Plateau, to Timberline Lake, and to Sentinel Falls. Fishing is of the finest, and the angler will find many opportunities for dropping a fly into some froth-covered pool and instantly be rewarded by a strike full of snap and fight.

An auto will take you to East Rosebud Lake and resort approximately twelve miles from Roscoe, Montana. The lake is a mile long and half that wide, and is at an elevation of 6,500 feet above sea level. Fishing is good in the lake, and the streams offer equal sport. The region surrounding this area is replete with scenic detail. Here are the lower cascades of the East Rosebud. The gorge



SMASHING PEAKS, LAKES SET FAR DOWN IN CHASM-LIKE BASINS AND DIZZY HEIGHTS OFFER REAL "ROUGH STUFF" TO THE VISITOR TO THE BEARTOOTH

of the East Rosebud is worthy of a visit and a trip to Elk and Reed Lakes offer interesting day's outings full of keen appreciation of the life of out-of-doors. Snow Falls is another objective for a tramp while hanging high amidst rocks and timber is Shadow Lake where are mirrored reflections of mountain and sky. From this point too, one may try the ambitious climb to the top of Mount Shepherd, to Snow Lakes or to the high Snow Fields of the East Rosebud.

A few miles west from the east branch of the Rosebud is the West Rosebud canyon. A good trail connects the two and a visit of any time to this area will be in the nature of a camp trip. A passable wagon road reaches Emerald Lake on West Rosebud. It is a lake which deserves to be popular, for here nature made a place which is naturally attractive. The scenic values are excellent, the fishing is good, and around the lake luscious mountain huckleberries grow in profusion. Who could ask for more than a natural bed of delicious wild berries at hand, good trout fishing in lake and stream and scenery which will satisfy the most exacting soul? But sad to relate, there is one horrible scar on the landscape here which was caused by those very people who came to enjoy that which they destroyed. Careless campers left a fire one day and now the timber on the northern shore of this gem-like mountain lake is charred and blackened. Years will pass before healing timber growth will cover the marring tracks of the fire demon. Someone, careless, ruined a beauty spot to which



ONE OF THE WORLD'S MOST REMARKABLE ICE-FORMATIONS—THE GRASSHOPPER GLACIER OF THE BEARTOOTH NATIONAL FOREST

you have equal right with him, and the sad part of the whole situation is that it could have been avoided with reasonable care. Do *not* thou go and do likewise.

Emerald Lake is the largest of a chain of three. Less than a mile from these, and reached by a good trail is the West Rosebud cascade, a water feature that possesses striking beauty. Two miles farther, following the stream and trail brings one to Mystic Falls, where the entire West Rosebud leaps madly over a granite cliff. The trail here stops abruptly where the leaping water, in more than a hundred feet sheer fall, splashes from the higher bench.

For those who will climb on foot and clamber up the rugged granite wall there is a scenic treat, rich in offerings. From the crest of the cliff up which the foot path leads, spreads out a large broad valley. In the immediate foreground is Mystic Lake, the largest body of water in all the Beartooth. It is two and a half miles long, three-quarters of a mile wide and covers about nine hundred acres. Other lakes lie back of this body of water, but can be reached only on foot and one must pack his entire outfit and supplies to their shores by his own strength.

On the west of the Rosebud country is the Stillwater River, the largest stream in the Forest and among the most picturesque. An auto road reaches Wood's ranch from Columbus and here one may stay and outfit for pack trips that will take several or many days to complete. From the ranch the Stillwater trail leads up stream by fishing spots and camp grounds which invite one to linger. The trail passes Woodbine Falls, where the water



SHADOW LAKE RICHLY DESERVES THE NAME, FOR THERE ARE MIRRORED TREES, CLIFFS AND CLOUDS WHICH FLEE AT THE MEREST FLICKER OF A BREEZE

drops several hundred feet within view of the traveler on the trail. Through the Devil's Half-acre the trail is blown out of solid rock. Beyond this is the Washboard, where huge rock slides from both sides of the stream have almost closed the valley and have formed a series of rock ter-

aces over which the water foams and splashes. A little beyond this point the river widens into Sioux Lake, in which is a large island where there is a good camp spot with wood, water and horse feed handy.

The Meadows on the Stillwater, above Sioux Lake offer a wide panorama of the mountains that parallel the stream and here is the best fishing grounds of the river. Big Park Ranger Station is the first point where virgin green timber stands and from here on the Stillwater trail passes through country that is wild and rugged. Horse-shoe creek is crossed. From its source to its mouth it is almost a continuous cataract. This creek drains the Lake-of-the-Woods and makes one of the features accompanying a side trip which can be taken to the lake. Up and on the trail leads until Daisy Pass is reached, and here one stops to drink in the magnificent outlook on mountain fastnesses. South are Pilot and Index Mountains, Wyoming's two highest peaks. To the southwest one looks down upon Soda Butte Creek and Cooke City and the north-eastern portion of the Yellowstone Park. Standing in Daisy Pass the traveler is at the threshold of some of the most interesting wonderlands of the Beartooth. Per-



WATER FEATURES OF THE BEARTOOTH MAKE MANY OF THE MOST STRIKING OF ALL THE MANY LANDSCAPE DETAILS FOUND THERE

haps the most curious glacier in the world is found here. Indeed it can claim distinction on its unique feature which would make it an unusual scenic value among many glaciers. It is the Grasshopper Glacier and in its ice it carries thousands of grasshoppers preserved in freezing condition for many many years and of a species that is now extinct. The grasshoppers that have been preserved in this curious manner are of a species that were migratory in habit. It is believed that centuries ago, before white men came to this continent a vast horde of these insects were flying over the mountains at a high altitude when they encountered a severely cold air current. The low temperature killed the grasshoppers or drove them to an alighting place and they were caught in the ice and snow of the glacier. The glacier with three smaller ones lies in a huge semi-circle extending from the north and east edge of Sawtooth Peak to Granite Peak, making a continuous stretch of ice over three miles in length. The best time to visit the glacier is late in August, just before the new snow begins to fall, for at that time the snow of the preceding winter has melted away, exposing the caverns and crevices where

many ice formations can be seen. Granite Peak, within the Beartooth is the highest mountain in all Montana, and is 12,950 feet above the sea. Other high peaks of the area are Mt. Wood, 12,900 feet elevation; Mystic Mountain, 12,646 feet; Mt. Hogue, 12,600, and Mt. Villa, 12,700. Mount



RICH GREEN TIMBER CLOTHES THE SHORES OF ROCK ISLAND LAKE AND LILIES REST ON THE SURFACE. BEARTOOTH NATIONAL FOREST.

Bald, Sawtooth, Beartooth, Castle Rock, Dewey Mountain, Snow Peak and many other high points in the range are near 12,000 feet above sea level. Plenty of opportunity to do hard climbs is offered those who are keen to reach the tops of peaks that mean hard hiking.

All of the principle streams of the Beartooth head within a comparatively few miles of each other in this rugged region of peculiar glaciers, snow fields and lakes. It well may be believed that the scenic values found in this neighborhood are great and that one seeking the wildest and roughest mountain lands will find them here.

Lakes abound in alpine locations. Goose, Burke, Rock Island, Round, Lady-of-the-Lake, Kersey, Wide-water, Russell and Farley Lakes are but a few of the many that nestle in settings of spruce and fir on the sides of majestic mountains. Fish taken from these high lakes have the snap and vim to put up a good fight and the flesh is especially delicious. Good camp grounds are found at most of these lakes and the whole region is one of the most striking vacation grounds to be found in the west.

Only a few of the many beautiful and interesting features of the Beartooth can be told here. More than three-quarters of a million acres are within the boundary of this Forest and each acre has some new interesting thing to offer the visitor. Most interesting of all, this whole vast playground is open to recreational use by all of the citizens of the United States. Perhaps an urgent invitation to visit the Beartooth should be extended only to good citizens, for good citizens do not take chances with forest fires, and clean their camps when they leave.

But you are all welcome to come and play in the Beartooth National Forest. It is one of the hundred and fifty-three great play areas found within the National Forests which you own equally with the next citizen. Its streams, peaks, canyons and unusual glaciers belong to the public. One of the most potent services which a forest

can render to its owners, Uncle Sam's nephews and nieces, is the opportunity for play out of doors. So it is but following the general policy of the entire Forest Service when the Beartooth invites you to come out in the wilds next summer and get personally acquainted with the Grasshopper Glacier or the Mystic Falls or climb the craggy head of Granite or Beartooth Mountains.

Do you long for a country where towering mountains look on glassy lakes, where trails lead past never ceasing

beauty, where the meadows are flecked with nodding flower blooms and a dashing cascade or murmuring stream calls welcome? Do you plan your vacation next summer to visit hotels or do you think of waking in the morning to the chatter of a pine squirrel or pinon jay, where the shelter you have lodged in during the night is a tent carried during the day on the back of horse or your own shoulders, where the only bed you may know for days is a spruce or fir bough mattress and your dining room is the whole top of a mountain range? If you have the desire to step off the beaten paths of travel, to camp on the bank of some clear stream or mirror-like lake, to see great uncommercialized recreation country of rugged National Forest play areas you can make no mistake in picking on the Beartooth National Forest as your next vacation land. For there beauty is as wild as the breezes that sing in the spruce boughs and God's handiwork, in all its untrammelled magnitude, en-



MYSTIC FALLS, A SUPERB SCENIC VALUE IN THE MOST SCENIC OF THE BEARTOOTH REGIONS

dows a vacation country of unsurpassed appeal.

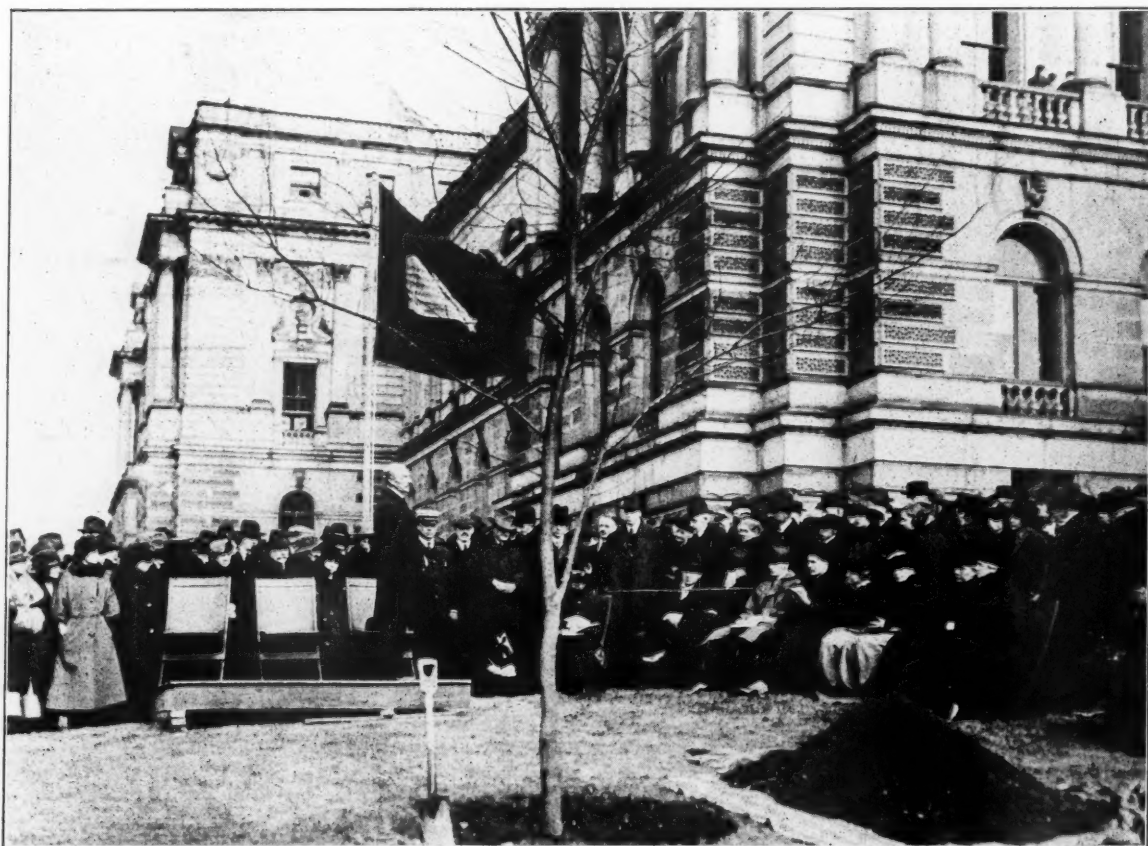
This is your introduction to the Beartooth National Forest. Making its acquaintance requires your presence there. That is up to you; so if your next vacation is going to be off paths that are over-well trodden and in the land of the Stillwater River or Rosebud Creeks or anywhere in the Beartooth, write the District Forester, Missoula, Montana, or to the Forest Supervisor, Beartooth National Forest, Billings, Montana, and ask where to go, how to get there, and what to see, in more detail than is possible here

LIBRARY OF CONGRESS HONORS MEMORY OF HEROES

AN impressive ceremony attended the planting of a Japanese elm tree on the grounds of the Congressional Library, December 7, placed in honor of the four men from the Library who gave their lives in the World War. The men were Corporal Charles Edwin Chambers, Company C, 312th Machine Gun Battalion, 79th Division; Lieutenant Edward Theodore Comegys, 11th Aero Squadron; Corporal Frank Edward Dunkin, Company I, 54th United States Infantry, and Corporal John Woodbury Wheeler, Company B, 104th Field Signal Battalion, 29th Division.

The Librarian, Dr. Putnam, presided at the exercises and paid high tribute to the character of the men, saying

four men, but also of the cause which they served. It should be with us a living thing, a growing thing. It should have within it a power to serve. It should refresh and invigorate us in times of peace; it should steady us and give us faith in times of stress. And it should endure—to the lasting profit of the community we serve, and of that everlasting cause which, though wars may cease, will always, in some form, require of us the sacrifice of self." Appropriate remarks were also made by Representative Julius Kahn, Chairman of the House Committee on Military Affairs; by Colonel E. Lester Jones, Director of the Coast and Geodetic Survey, and by Captain



Underwood and Underwood.

MEMORIAL TREE PLANTING AT THE CONGRESSIONAL LIBRARY

As a tribute to four employees who died in the World War, the staff of the Library of Congress planted a memorial tree on the Library grounds. The Librarian, Dr. Herbert Putman, who presided at the ceremonies, is shown standing on the platform.

that the memorial placed for them there on the Library grounds was most fitting and that "of all forms of memorial a tree is the most symbolic. It is a living thing. It is unselfish; the elements that it draws to itself—warmth of the sun, moisture of earth and air—it gives forth again in beauty and in protection. We plant it, not to bury it, but to enlarge its life and opportunity. It is to grow,—in stature, in vigor, in beauty, in service. It is to endure,—not merely in its own generation, but in the later generations which will be its offspring. So the memory which it holds for us: the memory of these

Garland Powell, who commanded the Aero Squadron in which Lieutenant Comegys first served. A section of the Marine Band furnished the music and through the courtesy of the commanding officer of Bolling Field, a group of airplanes flew over the audience during the exercises. Dr. Putman put the first shovel full of earth about the rocks of the tree, and he was followed by Captain Averill, Superintendent of the Library Building and Grounds, and members of the staff and relatives of the four men. The tree has been registered on the Honor Roll of the American Forestry Association by Mr. J. Bentley Mulford.

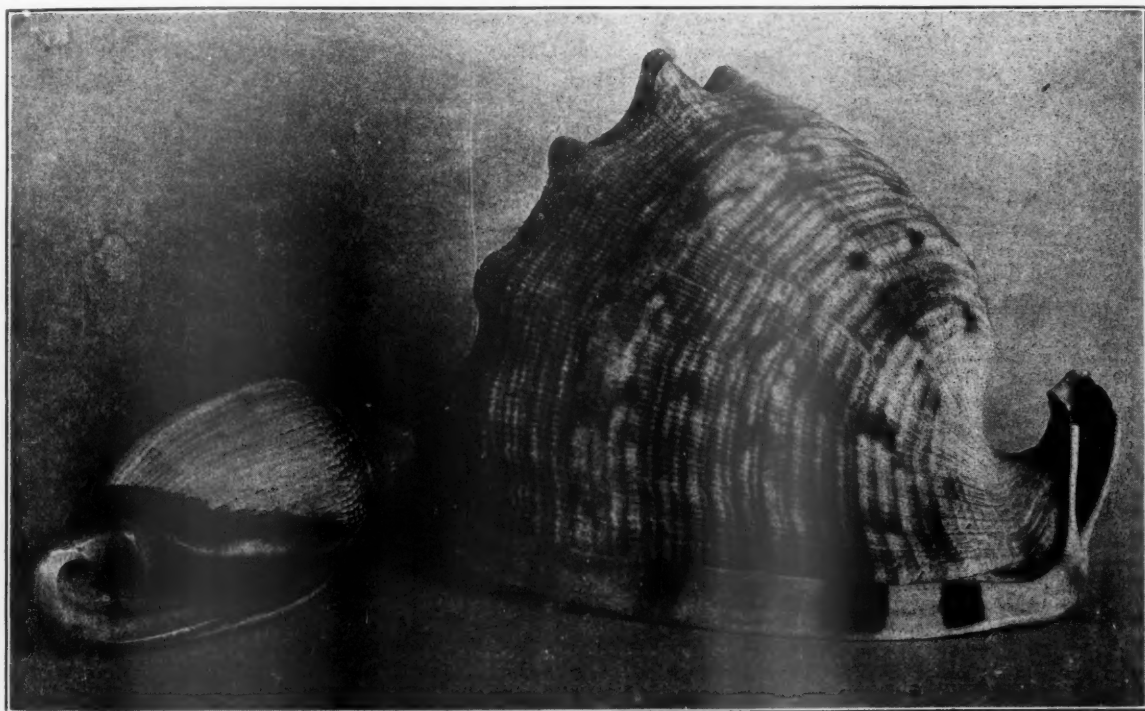
NATURE PHOTOGRAPHY

BY R. W. SHUFELDT

(WITH PHOTOGRAPHS BY THE AUTHOR)

NOT long ago the writer was in conversation with a vigorous young man who had traveled very extensively in South Africa and other parts of the world; his record achievement lay in the fact that he had twice walked from Cape Town to the mouth of the Nile. He had gathered a mass of anthropological notes upon the natives he had come in contact with—which, indeed, had been his main object; but beyond this he had made no attempt to bring back any results obtained by his camera, shedding light on what is to be found along

Apart from such instances as might be furnished by world travelers of other countries, no end could be supplied from the records of our own people—the members of the American Forestry Association forming no exception; indeed, such records are annually increasing since the extensive introduction of the automobile into home and foreign travel. Many of these travelers command unlimited pecuniary means, together with all sorts of facilities; yet it never seems to occur to them what a mass of information they might gather, which, if turned



THE PHOTOGRAPHY OF SHELLS

Figure 1. The larger shell is a fine example of the Sardonx Helmet (*Cassis tuberosa*), which is found on our Atlantic Coast, from North Carolina southward. This is a Key West specimen.

other lines in the wonderful countries he had tramped over. Especially was this true with respect to the fields of zoology and botany. This is but a single example, chosen to illustrate untold thousands of others similar to it in all respects. One young man of the writer's own family had passed over hundreds upon hundreds of miles in the Orient—in Japan and the East Indies, in the heart of Africa, and across an utterly unknown part of the continental island of Madagascar; but not a photograph had he made of any of the rare and unknown plants and animals he met with in these extensive travels, nor any notes upon their habits. His Madagascar collection consisted of the tail of a common lemur!

over to scientific descriptionists on their return, would prove not only of inestimable value to various departments of science, but would greatly redound to the credit of our country, and stimulate the advancement of civilization at large. Many people of this class have justly earned the name of "globe-trotters,"—and, indeed, they have no ambition beyond it. They travel but to unload their purses, for the sake of saying that they have been here or there—and thus have something attached to themselves not experienced by others. Very frequently these others have failed of such advantages through lack of funds and opportunities; though had they enjoyed them, they would have given something to the world

worth the while. Still another class is represented by people more or less intelligent, with eyes, and, up to a certain point, observing. When such return to their homes, be it in New York, Chicago, Washington, or some other city, after spending months in the unknown parts of Thibet, or Borneo, or up the great rivers of South America; after scrambling through the forests of Java and the jungles of India, or rambling along the shores of Formosa, Java, or Timor—in recounting the incidents of their explorations, ever and anon they will tell of some remarkable butterfly they saw in swarms on the edge of such and such a forest; a marvelous shell they discovered on such and such a beach; or a most wonderful bird they saw, the male of which, when the female had laid her single egg in the hollow of a tree, sealed her up in the cavity with mud, feeding her through a hole purposely left in it, until the young one was ready to leave the nest. At this point in the tale, in these days, someone present naturally asks: "Did you have your camera with you?" Upon being answered in the affirmative—backed by a "why?"—the interrogator will have very good reason for inquiring why no negatives were made of all these things, when it was possible to do so. Usually comes the answer: "Yes, I could have taken no end of such photographs; but of what use would they have been to anyone? Naturalists must be familiar with all such things by this time."

This is far—very far—from the truth in many, many instances. And, while naturalists may possess the fact or facts in regard to the *habits* of this or of that—bird, bat, or butterfly—they only too frequently have no photographic pictures illustrating its appearance in its natural habitat, and the character, in some instances, of its actual environment. Intelligent travelers who have availed themselves of every possible opportunity their various journeyings have offered them, turn from such people with a deep sense of disappointment, not to men-

tion envy, associated with the feeling that these opportunities, so barren of final results, could not have fallen to them.

Omitting, perhaps, one or two subclasses of such travelers, we finally meet with representatives of a limited group that are worth the while—the group for which this article has been written. Such a representative is of an inquiring mind; fearless to the point of

recklessness; an intelligent observer—indeed, he possesses all those mental and physical requirements and traits of character, found in explorers of little-known parts of the world, that make for success and achievements, and that finally materialize in the form of results bringing the most good to the greatest number of people. When such a person, armed with the proper equipment for taking serviceable photographic pictures, meets with some interesting flower, plant, or tree, in the far-off wilds in the least traveled parts of the world, he sees to it that he secures a negative of it, as good a one as he could possibly make under the circumstances attending the discovery of the specimen.

Travelers of this class are often of a receptive order, and more than desirous of acquiring the kind of knowledge of field photography which will enable them to make negatives, prints from which will constitute positive contributions to science, to popular literature for the instruction of the average reader, or for authoritative textbooks, to be used in the class-rooms of schools and colleges. Now, there are

a great many points that the photographer of plant and animal life in the field must know and master before he can command a class of pictures that will be of value and use in the quarters above enumerated.

Perhaps the least successful person in work of this class is he who believes he possesses a complete knowledge of all that is required; who thinks that all one has to do to get a picture is to point one's camera at the



JACK-IN-THE-PULPIT AS IT GROWS

Figure 2. Often it is difficult to obtain a photograph of a flower growing in the shady woods. In this picture is shown the exact appearance of a plant taken in such a situation.

animal to be taken, then to focus and touch the button. This is the class that goes "snap-shotting" through the jungles and forests, under the impression that a "snap-shot" is the whole thing and the best that any one can do. This idea is very wide of the mark, as will be shown further on. To be sure, now and then—perhaps one in thirty—a scientist or scientific illustrator may be able to use such a result, but rarely oftener. Our "snap-shot" photographer, in a little-known country, may, on some occasion, meet with a gorgeous butterfly resting on a rare and beautiful flower, a good photograph of either of which would constitute a positive contribution to pictorial biology. He levels his camera at it, focuses, presses the button, and takes up his way again, flattering himself that he has a picture that will cause science to sit up and take notice. Well, he may have, or he may not; the chances are, if he has had no instruction in such matters, that the photograph he will get on his return to base



BUMBLE-BEES AND HORSE MINT

Figure 3. A District of Columbia specimen of Horse Mint, and an exceptionally fine one. Photography does not do it full justice, as it is an extremely showy plant.

within the realm of civilization will not be worth the paper it is printed on.

Very frequently an unsuitable camera and accessories are selected by the traveler for such work; but this is a subject which the limitations of space will allow of but scant treatment. If circumstances admit of it, it is best to be provided with *two* cameras, and both must be the best of their kind to be found in the market; in fact, one should be supplied with only the best of everything, in order to secure results at all worth while. Material for

instantaneous work is absolutely essential. One camera may be a very small one, to be used for a class of subjects that will bear enlargement, while the other should be at least six and a half by eight and a half for sub-

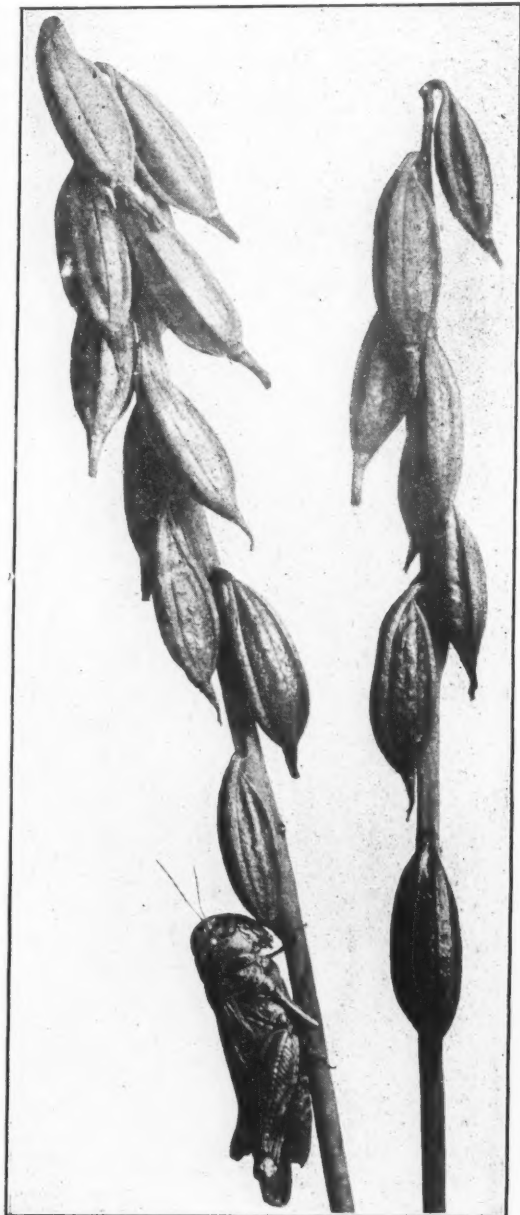


BLOSSOM OF THE POPLAR TREE

Figure 4. This flower has been posed so as to exhibit almost its entire structure. Large tropical orchids and other showy flowers can readily be shown in this way. A small piece of pure white cardboard answers for a background.

jects demanding a sharp negative of a larger size, where enlargement is undesirable or fatal to the requirements. For the traveler, films are far and away ahead of dry plates, as the latter are very likely to be broken; besides, films weigh much less, and take up far less room.

Now let us suppose that our world traveler is passing through the forests, or over the open country of some little-known part of the globe. He may be on foot; he may be transported through the aid of native conveyances; or fortune may have helped him to command a serviceable automobile. Then the questions present themselves to him: What is it that you want me to photograph for you, and how am I to go about it? Do you want people? No; leave that to the ethnologist and to the student of races. Moreover, the field has been pretty thoroughly worked, and science is in possession of an



AN ORCHID THAT LACKS A SPUR

Figure 5. These are the seed pods of the plant known as Adam and Eve (*Aplectrum hyemale*), its tuberous roots growing in pairs. It grows in the woods of the Middle Atlantic States.

enormous number of photographic pictures along such lines. Views? Villages and cities, customs, industries, and all such things? No; none of these. You will have no time for such work; and every bit of material you have with you will be needed to serve the purposes of what has been pointed out in previous paragraphs, which is to obtain photographs, of an up-to-date sort, of all botanical and biological subjects, such as will be welcomed by science; such as can be employed in literature, and

used in school and college text-books for the instruction of our students of all ages and classes.

The botanical subjects will consist of scientifically photographed trees and shrubs *as they grow*, singly, and in forests; flowers and their parts—as leaves, roots, and fruits; in fact, anything that falls within the realm of botany, as that science is now restricted. Brief instructions as to how best to do this will be given further on. In the plant and animal worlds there are a great many minute forms that the traveler could also obtain; but we must pass by such as these on the present occasion. However, should he possess any special knowledge in those fields, good photographs of forms he may meet with



FLOWERS, LEAVES AND ROOT

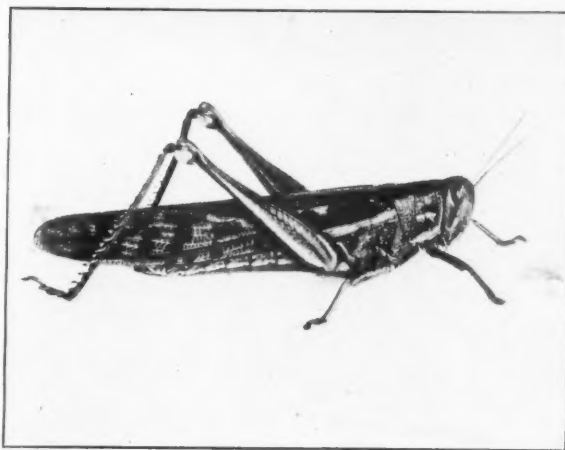
Figure 6. Roots of plants may only be studied satisfactorily by pulling them up and carefully washing them. When possible, it is very desirable to include them in the photograph of the plant to which they belong.

will, of a certainty, be most welcome, especially if accompanied by reliable notes and dates; indeed, *full notes* should be made to accompany every photograph obtained, be the subject what it may. These notes should aim to be of the greatest accuracy and made in black lead pencil,

in a serviceable blank book of a kind best able to withstand the effects of climate and traveling; they cannot be too full, and must be legible to a fault. Exact dates, time of day, and localities, are essential; form and color in life or thereafter must invariably be recorded. This not only refers to flowers and other parts of plants and trees, but to the fleshy parts of mammals, eyes, bills, feet, hair, and similar structures. If weights can be obtained, make records of these likewise, while full measurements (in the metric system) must be taken down in all instances.

In the case of animals of various kinds, brief notes on *habits* are also important and add value to your photographs. All such data can be closed by a few paragraphs of "Remarks," in which may be written out points not covered by any of the above requirements—as the number of negatives secured, rarity or abundance of the subject photographed, if specimens were obtained, and so on.

In matters of *form* and *color*, many marvelous shells are to be found in various countries, especially in the East Indies, and in the tropics of other parts of the world. Unless the traveler is devoting himself to the collecting of these, their weight becomes a very serious thing to be considered, and it does not take long to fill many trunks with them. Hence it will be appreciated that good photographs of rare or undescribed shells become both valuable and interesting material for the explorer to obtain. These can be photographed either indoors or out. Any white material will make a background for them, and they may be taken natural size. If photographed out-of-doors, it is well to use



ONE OF OUR BIGGEST GRASSHOPPERS

Figure 7. Pictures like this one can only be secured by using a white background and selecting a perfectly sound and healthy insect.

an artistic and pleasing result. The two shells here shown in Figure 1 will illustrate these two points; they were photographed natural size; lighted as suggested above, and their essential characters made distinctly evident. Had an expert conchologist never seen either of

these shells, upon seeing this photograph of them, he could instantly tell what the parts *not in view* were like. This is a great secret, and it requires not a little experience to carry out successfully in any particular instance. The record for these two shells might be completed by a photograph of the place where they were collected.

Many of the principles applying to the photography of shells hold true in the case of flowers. With them, however, it is far more important to secure the specimens *in situ* in nature, and this will frequently require all the experience and skill the traveler commands. A fairly good result is shown in Figure 2, it being the photograph of a Jack-in-the-Pulpit, taken in a swamp, on a gray day, with but little light to help out. Considering the conditions under which it was obtained, it is a good picture. Were it a rare orchid, photographed in an



LEAVES OF THE WILD GRAPE-VINE

Figure 8. A fine "six-spot beetle" is resting on the upper leaf of this grape-vine found in the Eastern United States. It is an insect very partial to this vine. It is also called the Spotted Pelidnota (*Pelidnota punctata*).

unknown part of the world, what a prize the traveler would have to bring home, and what interest it would excite among botanists!

In photographing delicate flowers like the Horse-mint (Fig. 3), we apply the same principles set forth in the



THE SPINY LIZARD OF AUSTRALIA

Figure 9. Many curious animals are found in Australia, and this is one of them. It is also known as the Moloch or Mountain Devil. One would hardly suspect this of being a dead specimen, and it is a good example of what may be done with such material by the aid of the camera.

case of the shells, although flowers constitute far more difficult subjects to deal with, as many of them wilt as soon as gathered. To obtain the correct point of view demands long study and experience; and the traveler must be familiar with the use of the color-screen, in as much as he is not likely to have orthochromatic plates with him.

When properly taken, large and showy flowers are beautiful photographs for the traveler to bring back with him; and when they are rare or unknown, he will be surprised at the amount of interest they will excite in many quarters. They may be so photographed as to exhibit nearly all the peculiarities of their structure, as in the case of the one here shown in Figure 4, which is a blossom of our Poplar Tree, so familiar to most of us in the Eastern States.

In the case of some plants, it is highly desirable to show the roots when possible, and to pose at least one leaf, in that its form may be shown, as in the case of the Aquatic Joint Weed in Figure 6; this is exceedingly important, and should ever be borne in mind. Often, when pictures are taken from the wrong point of view, they are not only useless and inartistic, but of little value to

students and botanists. AMERICAN FORESTRY has published many an excellent example of how to obtain successful photographs of plants growing in their natural habitat. Such pictures are frequently of great value; and the more the traveler secures, the better—the subjects representing intelligent results. And think for an instant what one hundred such as is here shown in Figure 4 would mean, obtained in the heart of New Guinea!

As a rule, all sorts of insects are far more difficult



A GREAT INSECT PEST

Figure 10. Here we have a good view of one of the greatest insect pests in the United States, the tent caterpillar, full-grown, with three of the white cocoons this species makes. The beetle is one of the "searchers," and preys on caterpillars.

subjects to secure good photographs of than are flowers, while they are equally interesting and valuable. The difficulties are due chiefly to the fact that it is not easy to pose them properly in order to get the best scientific photographs. Then their being generally alive, their movements are often difficult to deal with, and those movements are of so many kinds. Often caterpillars will not remain quiet for an instant; grass-

hoppers eternally move their antennæ to and fro; large moths and some butterflies vibrate their wings for as much as twenty minutes at a time, and beetles "walk out of the picture" without so much as asking your permission. Still, with patience and practice you will often obtain fine results, and command prizes which it surely will be a great satisfaction to have secured.

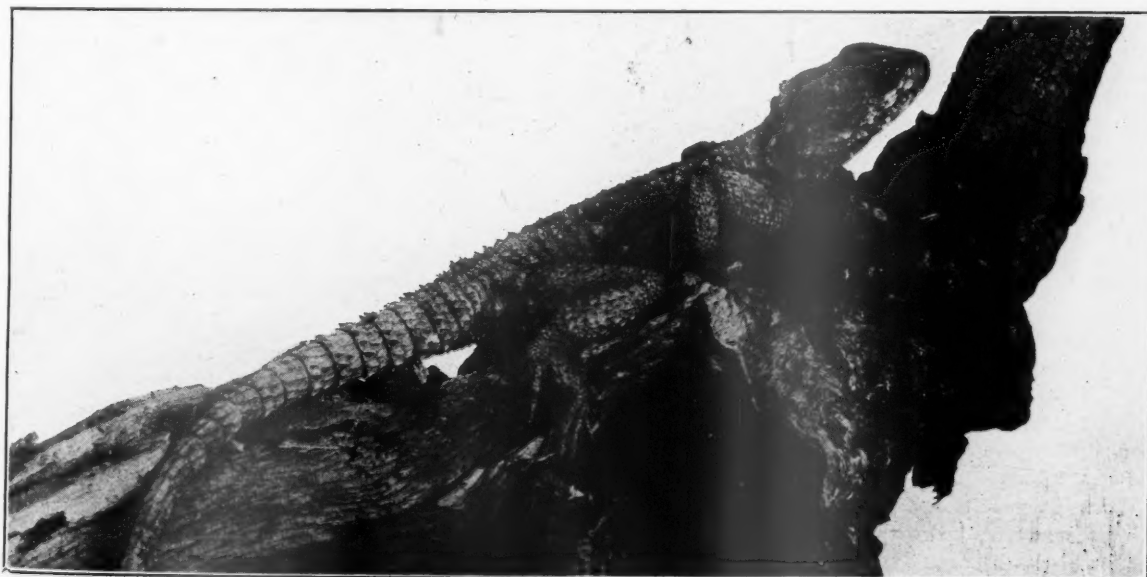
Occasionally you may "kill two birds with one stone" and get a photograph giving an excellent picture of some desirable insect, resting on a plant, or on part of one, of equal value to science. A good example of this is here shown in Figure 5. Note how a direct lateral view of the grasshopper was obtained, and that it shows not the slightest movement, especially in the delicate antennæ that projects from between the eyes. The negative from which this illustration was made gives this insect the size of life. Should the plant be one

upon which the insect feeds, so much the better, for this adds greatly to its value. Figure 8 offers an excellent example of this, where we note our common grapevine beetle—the six-spot *Pelidnota*—on the leaf of a grape-vine, and we are all familiar with this combination. With the proper requirements at hand, and with patience and skill, the same result could have been attained in the heart of a Brazilian forest—and the beetle and plant, upon a leaf of which the insect is resting, might both have been totally new to science.



A DIFFICULT SUBJECT

Figure 11 The Blue-tailed Skink is one of our American Lizards, an extremely difficult species to photograph when alive on account of the lightning rapidity of its movements.



STELLION LIZARD

Figure 12. These big, sluggish lizards offer easy subjects for the experienced photographer, but their pictures are none the less valuable on that account. This is a fine specimen of the Stellion of Asia (*Agama stellio*). These lizards are extremely susceptible to the effects of cold.

The uninformed traveler has passed by thousands of such subjects in the tangled jungles of but little-known lands.

By using a small piece of white paper, or, indeed, any light colored material, an insect may be photographed "in the clear," as is here shown in Figure 7, which is an excellent photograph of the female of our well-known



THE SPARROW HAWK

Figure 13. This species of one of the handsomest of the smaller American falcons is readily tamed, and makes a very gentle and interesting pet. The writer had this specimen for quite a long time.

American Locust, taken shortly after its capture, and perfect in the matters of health and structure.

From such results as these, and through the advantage gained by actual experience, the traveler may soon acquire the skill necessary to obtain photographs of insects in their natural habitats. A good example of such work is also shown in Figure 10, which is of a common beetle and a caterpillar.

When we come to fish—or, in fact, to any forms that live under water, including such forms as the lobster and its kind—the portable aquarium is a very desirable accessory. A small treatise might be written on the photography of living fishes in their natural element—in fact, the writer was the first in this country to succeed in such experiments (United States Fish Com-

mission, 1898), and he has contributed to magazines and scientific journals quite a number of articles on this subject. Should the explorer or all-around traveler fail in the use of the small, portable aquarium, photographs of dead fish, when properly taken against light-colored backgrounds, are very acceptable. One must be careful to spread the tail and fins in a normal manner, in that their form and structure may be readily appreciated. Full notes ought invariably to be made on fishes, especially in the matter of habitat, size, colors, sex (if possible), and weight.

With respect to turtles, and to more or less similarly formed creatures, it is quite necessary, whenever possible, to make two photographs of the animal, for the reason that the views from above and below are so utterly different. There are some wonderful turtles in



BIRDS' NESTS ARE EXCELLENT SUBJECTS

Figure 14. Our Redwing Blackbird often builds its nest as here shown, and when this is the case it may be seen in nature a considerable distance away. The eggs are very beautiful, being a pale blue, with curious, irregular and eccentric line-markings in black. Such a picture is as good as having the nest at hand, as every detail of its structure is shown.

tropical and subtropical countries, only a few of which have been photographed in life—particularly in their native haunts.

Lizards constitute another class of which we stand much in need of good photographs—of living specimens preferably, but of rare, dead ones in the event of live ones being unobtainable. A little while ago, Mr. Dudley

Le Souef, Director of the Zoological Gardens of Melbourne, sent the writer a dried specimen of that most remarkable lizard of Australia known as the Moloch or Mountain Devil. It had been dried in a most natural attitude, after having been taken out of the alcohol wherein it had been kept for many years. So natural was its pose, that the making of a photograph was at once suggested, and it is here reproduced in Figure 9 as an admirable example of what can be done with a dried specimen of an interesting lizard from far-off Australia. Of course, living lizards make much better pictures, but some of them are by no means easy subjects to photograph. When sluggish and gentle, as the foreign specimen here shown in Figure 12, the difficulties to be encountered are by no means great; and after one becomes

distinguished traveler who spent three years in unexplored Africa. He had upwards of 300 exposed films of localities, natives, animals, etc., when he returned to Berlin, where the custom officers, although implored to desist, opened them all in a light room "to make sure that there was no smuggling going on!"

In Figure 11 is presented a photograph of a living lizard; it is taken in a very natural pose on a light-



A GROUND SQUIRREL

Figure 15. We have here a photograph of a dead animal of no great size. Had the specimen been a rare one or an undescribed species, such a photograph would be of the greatest use and value to science. It exhibits nearly all the external characters of the animal—as pelage, tail, feet and general form, together with the type of head and its general parts.

a little expert, the making of a negative is but a matter of fifteen or twenty minutes. Some travelers prefer to pack their exposed films in a suitable box, and develop them on their return to civilization; but this, however, is frequently a dangerous practice, and reminds one of a



SOUTH AMERICAN MARMOSET

Figure 16. Dead animals may often be photographed in such attitudes as to simulate the living species. Here is a good example of such a feat. The Marmoset is one of a group of small mammals related to the monkeys.

colored rock, and distinctly shows nearly all of its characters, particularly the form, markings, feet and proportions. As a rule, such pictures can only be secured indoors under favorable conditions, as these lizards are very timid, easily startled, and extremely difficult to recover if they once get away. Other forms, like some of the iguanas, are quite the reverse of all this, and offer no special difficulty to the explorer.

When we come to birds, the chances are that the world traveler will not secure many photographs of them, although an attempt should be made to do so whenever a good opportunity presents itself. Many sea-fowl are readily photographed, as they exhibit but little fear of man in countries rarely visited. And it must be remembered that excellent enlargements are easily made

from negatives of very small size. Good photographs of birds' nests are often of great interest and prized by the ornithologist. Care should be taken that the correct point of view is selected from which to photograph them, not only to give the form of the nest, but what is in it, be it the eggs or the young of the builder. Figure 14 is the nest of the Redwing Blackbird, and demonstrates the above points very well; it was secured in Virginia by the writer. All sorts of nests are constructed by birds, and a collection of good photographs of them are well worth the while. There are communal nests, where many individuals build and occupy it in common; large nests built entirely of mud, as by some of the birds of Australia; while others make no nest at all, but lay their eggs right on the ground or sand.

When birds are captured and become more or less tame, beautiful photographs may be obtained of them indoors, and some of the writer's best results have been secured in this way, as may be appreciated by referring to Figure 13, which offers a picture of our handsome little Sparrow-hawk of Eastern United States. In little-frequented countries it will often be seen that the natives have captured various species of birds found in them, and keep them about their habitations. As a rule, no trouble is experienced in obtaining photographs of these, especially if one has the faculty of easily cultivating the friendship of the natives and getting them interested. When the writer was in Zuni a number of years ago, he noticed that those Indians had captive eagles, and there

was no trouble at all in getting photographs of them, as they were kept in the open and very tame.

Should the explorer be detained for any length of time among little-known natives, in a country of which scarcely anything is known, it is not a difficult matter to have some obliging member of the tribe, for the gift of a very trifling object, go and capture some of the birds for him. The eminent traveler and naturalist, the late Alfred Russel Wallace, often succeeded in obtaining the beautiful birds of paradise in this way, and his account of it in his charming work on the Malay Archipelago gives vivid description of how he accomplished it.

Passing to *mammals*, the rules and aims already pointed out above are found to be equally applicable to them. The chances are, however, that one will see a far greater number of these dead, than is the case with some other forms. Still, if properly photographed, pictures of dead mammals, particularly should they be rare species, are of value to science. The little ground squirrel here shown in Figure 15 shows very well how to pose a small dead mammal in such a way as to exhibit the majority of its external characters and general appearance. Any mammalogist could identify this species from such a picture, if the traveler's notes give the locality where it occurred, the color, size, and so on. In Figure 16 we have a dead Marmoset, a photograph which the writer made of one of these interesting little monkeys that died in captivity. It was taken in that the curious form of its ear might be studied.

FOREST EXPERIMENT STATIONS

THAT there is a growing realization of the need for adequately manned and thoroughly equipped forest experiment stations in the important forest regions of the country is shown conclusively by the fact that the following bills providing for such stations are now pending in Congress:

For a Northeastern Forest Experiment Station, S. 3822 and H. R. 12,188, introduced by Senator Keyes and Mr. Wason, respectively.

For an Appalachian Station, S. 3558 and H. R. 11,336, introduced by Senator Overman and Mr. Weaver.

For a Southern Station, S. 3946 and S. 4611, introduced by Senator Fletcher and Senator Ransdell.

For a Lake States Station, S. 3640 and H. R. 11,717, introduced by Senator Nelson and Mr. Carss.

For a Colorado Station, S. 4676 and H. R. 14,477, introduced by Senator Phipps and Mr. Timberlake.

For an Arizona Experiment Station, S. 4776, introduced by Senator Ashurst.

For a California Station, S. 3741 and H. R. 12,483, introduced by Senator Johnson and Mr. Osborne.

For a Pacific Northwest Station, S. 4703, introduced by Senator McNary.

Of these bills, those for the Colorado, Arizona, and Pacific Northwest Stations and Senator Ransdell's bill for a Southern Experiment Station have been introduced since the opening of the present session of Congress. In addition to these specific bills the Secretary

of Agriculture, in his appropriation estimates for the next fiscal year, has requested an increase of \$105,000 in the appropriation for forest investigations, a large part of which would be available for experiment station work, although the total amount requested would fall far short of financing adequately a station in each of the important forest regions of the country. The Secretary of Agriculture, in his annual report for 1920, has also emphasized very strongly the need for thorough-going investigations as a basis for forest management. His statement on this point is as follows:

"Full productiveness of our forests can not be secured without full information regarding the means of controlling their growth. Unfortunately, at a time when better knowledge is particularly urgent, the machinery for obtaining it has been seriously curtailed as the result of decreased appropriations. One consequence of this has been the virtual abandonment of the forest experiment stations in the West, at which many of the most important investigations were centered. The number of these stations should be increased, not reduced. They are as necessary to forestry as the agricultural experiment stations are to progress in agriculture, and there should be at least one Station in each of the main forest regions of the country. Economic studies dealing with the prospective requirements of the various industries, and, in general, with the demands which the forests of the country should be prepared to meet, also are essential.

WINTER WALKS IN THE WOODS

SLEEPY HOLLOW AT TARRYTOWN, NEW YORK

BY J. OTIS SWIFT

(WITH PHOTOGRAPHS BY THE AUTHOR)

THERE is no spot in the lower Hudson River Valley having greater fascination to the well-read American than Sleepy Hollow, just above Tarrytown. It is also full of interest to the naturalist and the lover of out-of-doors things. Almost every tree, shrub and plant to be found in this section grows in the forest of the mystic Hollow. It is frequented by nature-lovers, pedestrians and travelers, who reach it easily from New York by train, automobile, or a-foot. Every inch of its story—haunted farm land, woods and field is historic, and its very atmosphere is suggestive of dreams.

Come with me this winter morning along the old Albany Post road from Hastings-on-Hudson, and we will explore it. As we go down into the Hollow from Tarrytown, the first thing that attracts is the Headless Horseman Bridge where, the morning after Ichabod

Crane's famous ride, as told by Washington Irving, his horse was found without saddle, the bridle under his feet, and the hat of the unfortunate Ichabod beside a shattered pumpkin. The old wooden bridge has been replaced with a beautiful memorial structure, a gift of William Rockefeller, who lives in the neighborhood. To

the west of the bridge, which is crossed by the Post Road, or Broadway, is Philipse Castle, erected as early as 1683, on the banks of the Pocantico Brook by Frederick Philipse, the early Dutch settler, who acquired all the land lying between Spuyten Duyvel and Croton Point,

erected Flypse Manor, and became its first lord. Opposite Flypse-his-Castle and above the point where the limped Pocantico Brook glides under the Headless Horseman bridge stands an old Dutch church with the low mounds and crumbling head stones marking the last resting place of the friends and neighbors of Brom Bones, Baltas Van Tassel, and the beautiful Katrina Van Tassel. The little stone church is in keeping with the monuments with their Dutch legends. Farther up the hillside in Sleepy Hollow Cemetery, among the tombs of latter day residents



FOLLOWING THE BROOK THROUGH MORE LAUREL HAUNTED WOODS WE COME TO THE SHORE OF ITS SOURCE—POCANTICO LAKE



SILVERY BEECHES GUARD THE PATH WHERE POOR ICHABOD CRANE WALKED AND DREAMED OF THE LOVELY KATRINA

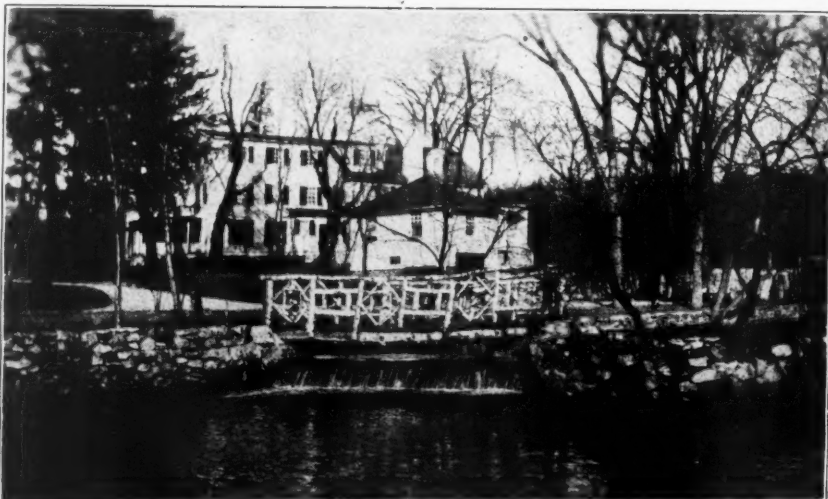
and millionaires of the section, is the grave of Washington Irving himself.

Down through the hidden ravine on the east line of the cemetery Pocantico Brook tumbles, laughs and gurgles over the dam beside which Ichabod used to walk and dream of Katrina, and where stood the old mill



OVER SUCH A QUAIN OLD FASHIONED WOODEN BRIDGE AS THIS IRVING'S "HEADLESS HORSEMAN" GALLOPED HIS WAY INTO AMERICAN LITERATURE

that Irving speaks of in the Legend of Sleepy Hollow. In the bottom of the ruined raceway lie the grist mill stones, broken, among a tangle of jewelweed, blackberry, ailanthus, raspberry, and tall wild lettuce. From here the brook, with a forest in which are many hemlocks and oaks on one side, and the well kept spaces and walks of the cemetery on the other, tumbles down over many small cataracts, from the open farmlands and forests above. It really is but a short walk up the brookside from park-like Broadway to the deep woods and ancient fields where the noisy brook, now still,



"FLYPSE-HIS CASTLE," ON THE BANKS OF POCANTICO BROOK, ERECTED BY FREDERICK PHILPSE, ONE OF THE RICH OLD DUTCH SETTLERS, AS EARLY AS 1683



THE LITTLE OLD STONE CHURCH IS IN KEEPING WITH THE MONUMENTS AND THEIR DUTCH LEGENDS. WASHINGTON IRVING'S GRAVE IS FURTHER UP THE HILLSIDE

glides under smooth black ice or openly past frozen castles, where fairies may dance on moonlighted nights. Great old red and white oaks, their mighty arms stripped of leaves and stark in the winter sunshine, guard the banks where Irving loved to linger and dream. Many ancient beeches, their bark silvery white, cut with deep initials and lovers' hearts, keep guard over the smooth path among the Christmas ferns and bayberry. Skunk cabbages stick their awl-like shoots up through the black loam just as they have for thousands of years, ready to blossom among the snowbanks of early

spring. We find oyster shells where the bank of the brook has fallen away—remains, no doubt, of the camping sites of the Wequaesqueek Indians, from whom the white men acquired the mystic valley. We hunt over the shell heaps for possible arrowheads and flint hatchets, but find none, for many curio hunters have gone before us in the almost three hundred years since a powerful savage tribe inhabited this hollow. In the deep recesses of the wood-lots the green moss above the roots of giant hemlocks is festooned with the lacework of partridgeberry vines, and on the gray ledges under the

coverlet of brown leaves our fingers, delving in cracks and crannies, uncover the sprouting roots of Dutchmen's breeches, Indian turnips, wind-flowers, and dogtooth violets, all ready to start growing again, the moment warm spring sunshine peeps down through the tree tops and stirs the cradles in which these babies of the wild sleep the winter away. Only the brown leaf coverlet is dead. All else seems pregnant with life. In the black loam are hundreds of tiny bulbs, corms, and seeds, each with its spark of life and energy. We feel like burglars who have disturbed a nursery at midnight. There is very little sign of death



POCANTICO BROOK TUMBLES AND LAUGHS DOWN THROUGH THE HIDDEN RAVINE, BY THE PATH OF THE EARLY DUTCH LOVERS



IN THE WORNOUT FIELDS BLIGHT KILLED CHESTNUTS IN THE "HOLLOW" RAISE WHITE ARMS PATHETICALLY TO THE SKY

about. Even the pungent odor of the loam suggests reincarnation rather than death. What a whispering and laughing of babies when all these infants start growing in the spring! What joy and merriment in the underbrush as baby after baby kicks off the bedspread of dry leaves with its pink toes!

As we go on, breaking through the dry stalks of moth-mullin, pig-weed, golden-rod and milk-weed by the brookside we come to where the brook tinkle-tankles over stones, and across from shore to shore lies the great trunk of a dead chestnut, a foot-bridge for lovers and fishermen.

All the chestnuts in the Hollow died of the blight a few years ago, but this old monarch has lain here for forty years, and chipmunks dodge into its crevices. In the wornout fields around, growing up now to junipers and cedars, are the skeletons of chestnuts that died of the blight, their naked white arms stretching pathetically skyward, but their trunks, nude of bark, still standing, through their great resistance to decay.

Downy woodpeckers, flitting from mossy tree trunk to decaying stump in the jungles; black-cap and Hudsonian chickadees hunting for food among the aro-



ACROSS FROM SHORE TO SHORE OF THE BROOKSIDE LIES THE GREAT TRUNK OF A FALLEN CHESTNUT, AN IDEAL BRIDGE FOR FISHERMEN

mantic budded cherry birches; white breasted nuthatches running head-downward along the bark of great tulips and maples; dozens of slate-colored juncos flitting along the path ahead of us, each displaying the two white feathers in the tail as they dance through the sunlight—suggesting glimpses of lace ruffles flashing among the feet of lovers at a harvest ball; and now and then a fluffy tailed gray squirrel leaping from bendind limb to sagging bough, remind us that there is still much life left in the winter woods, in spite of pot-hunters.

Where a country lane meanders down the hill from quaint Dutch farm houses between lichen stone walls, an old fashioned wooden bridge, such as the first Headless Horseman bridge was, crosses the brook. The hands that laid up the stone walls and the bridgeheads have been dust, perhaps, for two hundred and more years, but the thoroughness of their work still testifies to backaches suffered in the clearing and subduing of the land. Under the bridge, on a beam, we find the house of one of the later dwellers, a last summer Phoebe, who reared her brood here while barefoot boys and red-cheeked girls trudged past overhead to school.

By one of the roads that cross the Hollow from Ossining to Tarrytown we find the ruined cellar of a Colonial farm house that must have stood here the night that Major Andre came down through the Hollow to the enormous tulip tree, hard by, to his capture and undoing by three American patriots. In the story of Ichabod Crane's ride you will remember the tulip tree stood in the center of the road, "towering like a monarch above all the other trees of the region, a landmark seen for miles around, its gnarled, fantastic limbs curling down to the ground and rising again in the air." Perhaps tulip trees did those things then. Perhaps it was because the tree was known to the Yankee school teacher as the Major Andre tree that his frightened imagination made the great limbs, large enough for the trunks of other trees, contort in memory of the capture and sad fate of the British officer. There is such another tulip standing by the stone wall in front of the old cellar we are looking at. We pause to wonder who built this ancient manse, the stones in the cellar wall of which are

laid up with such fine precision. Is the family that once dwelt in peace and happiness here now extinct, or is it listed among the distinguished in the blue book of the metropolis? The chimney has fallen about the great fireplace in the living room. Perhaps Washington shared the family circle in front of the glowing andirons in this room, years ago. The fire that destroyed the house made a clean sweep of barns and outbuildings—even the well-sweep and the old oaken bucket. We lean down into the narrow, deep well, falling away into darkness. It is so deep the water never freezes in winter, and ten feet below us the mossy stones are chinked with masses of ferns still green and alive because of the warmth of the water and earth below. With an old rake tied to a stick we bring up one of the fronds and find it to be the narrow, sword-like blade of the ebony fern—now extinct in the neighborhood, but growing here year after

year and generation after generation in this old storehouse of Nature's refreshing drink. One wonders whether 'twas the fascinating Katrina Van Tassel who, wandering here with her two lovers so long ago, on a return from the upper reaches of the witching Hollow, dropped into the well from her



GREAT OLD OAKS, THEIR MIGHTY ARMS STRIPPED OF LEAVES, HELP THE YOUNG GROWTH OF JUNIPER AND CEDAR GUARD THE ANCIENT FIELDS, WHERE IRVING'S IMAGINATION PICTURED THE FAIRIES DANCING ON MOONLIGHT NIGHTS

basket of wild plants gathered for the garden of Castle Philipse, one tiny and delicate frond of the fern as Brom Bones or Ichabod poised the oaken bucket on the rim of the well for her red lips to drink from. Or else why, through the years and generations, while lovers succeeded lovers in the romances of the mystic Hollow, did the delicate and persistent fern continue to grow and spread among the damp rocks in the old well while it became extinct elsewhere?

We follow the brook through more laurel and pipsisiwa-haunted woods to the shore of Pocantico Lake where the brook rises, and from which the towns below now get their drinking water. Over the center of the lake fish-hawks, that have come up in a few moments from the wide stretches of the Tappan Zee, opposite Tarrytown, are wheeling and circling. How like airplanes they are! We wish, now that so much chill oxygen is in our systems from the long walk, that we were either fish-hawks or had an airplane, that we might be back home quickly.

THE LURE AND FASCINATION OF OLD BOXWOOD

BY A. A. LEWIS

THERE is no other plant which has such a lure, fascination, and romantic atmosphere about it as old boxwood. This plant has often been called the aristocrat of shrubs, for age lends it an air of dignity that no similar plant enjoys. At the mere mention of its name, the imagination paints pictures of stately old Colonial mansions, beautiful gardens, lovely women, and courtly gentlemen.

From the time the Druids of old England made long pilgrimages to the temple on the Hill of Box in the South of England and carried back with them a little sprig of the shrub which grew so luxuriantly there, to be planted at their own home shrine, down through centuries of garden progress in England, through many romantic and historic periods to our own times, there has never been a shrub so popular for its romantic association. The peculiar odor of sun drenched box seems to carry one back to other years and to people the scenes

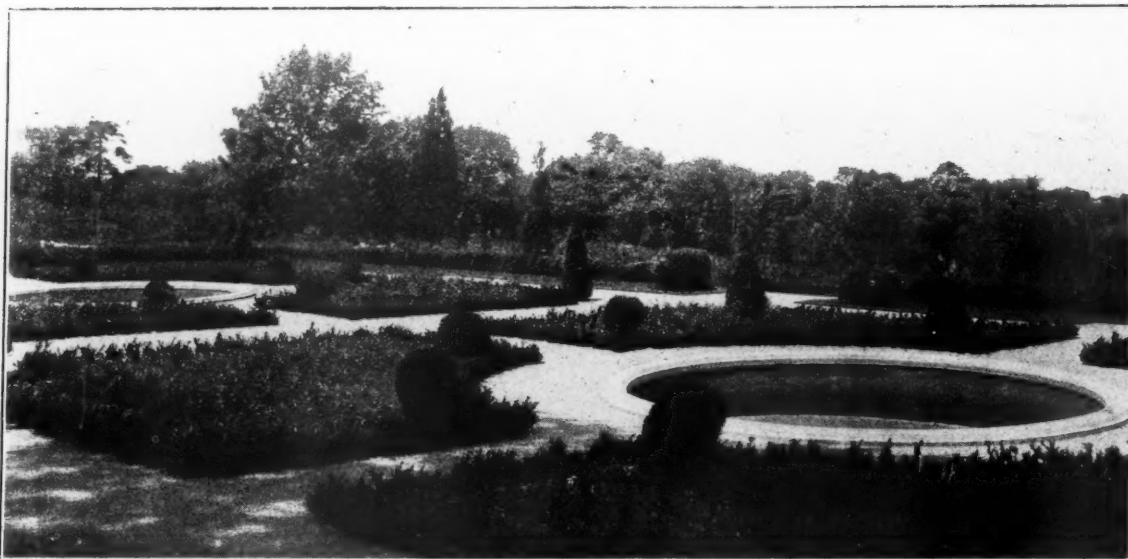
before us with the characters of by-gone romances.

Boxwood had been known for many years in England as an edging plant, for hedges, and to be carved into grotesque forms of topiary work. In fact, it formed one of the most important factors in the English gardens and so in view of this, it is little wonder that this is among the cherished possessions of the early colonists. The little sprigs were planted and carefully nursed, perhaps they were watered by the teardrops of the gentle housewife who longed for her pleasant home in England. Some of these little sprigs grew and prospered. This is especially true of those planted by the settlers in New Amsterdam and Virginia for here the winter conditions were not as severe as those of the Massachusetts Colony.

Along the Potomac and Delaware Rivers where there are so many of the old homes, in the remains of former gardens, now long forgotten, are found great masses of



THE BEAUTIFUL GARDEN ON THE PRATT ESTATE AT GLEN COVE, LONG ISLAND. THE QUIET BEAUTY AND RESTFULNESS OF THE SPOT IS ATTAINED THROUGH THE SHADOWS CAST BY THE LARGE TREES, THE FOOL, AND THE HALO OF ROMANCE AND WITCHERY WHICH SURROUNDS THE OLD BOX USED BY THE LANDSCAPE ARTIST TO MAKE THE PICTURE PERFECT. IT WOULD HAVE TAKEN YEARS AND YEARS TO SECURE THIS EFFECT OF AGE IF YOUNG PLANTING STOCK HAD BEEN USED



THE BEAUTIFUL NEW FORMAL GARDEN OF THE LUCKENBACH PLACE AT PORT WASHINGTON, LONG ISLAND. HERE IS FOUND A SECTION OF THE PRICELESS BONAPARTE HEDGE. IT WILL BE REMEMBERED THAT THIS IS THE HEDGE PLANTED BY JEROME BONAPARTE AT HIS STately COLONIAL MANSION "BOXWOOD," NEAR BALTIMORE, IN 1790, WHERE ONE OF THE MOST FAMOUS ROMANCES IN EARLY AMERICAN HISTORY WAS STAGED

box and sections of gnarled and knotted hedges; the story of the early glory of the ancient garden, now but a shadow of its former beauty. A few old fashioned flowers, an unkept garden walk, and a broken seat—beneath the cedar, are left to tell the tale.

In Salem, Massachusetts, which is the farthest point north where boxwood will grow, is a garden in which some noble specimens of boxwood still survive. These plants were originally part of the precious cargo of the "Mayflower," and were planted and cherished by these early settlers who laid their gardens out on the established plan of England with hedges and parterre beds. Of these little twigs, brought over by the sturdy colonists in New England, most of them were winter killed. The

heavy gales and winter snowdrifts played havoc with them, although now and then one comes across a fine specimen which has survived the rigors of time.

The life of boxwood is from one hundred to three hundred years, and during the centuries which it takes for a plant to mature, some mishap often befalls it which spoils it as a perfect specimen. Because of this, much of the old box cannot be used and a large quantity must be looked over before the proper selection can be made. Nevertheless, the boxwood supply has been, to date, sufficient to provide most of the large estates in the North.

Mr. Fred Lewis, of Lewis & Valentine Company, Roslyn, Long Island, Landscape Contractors, who spe-



A VERY INTERESTING ARRANGEMENT AND USE OF BOXWOOD IN THE GARDEN OF DR. PRESTON P. SATTERWHITE, AT GREAT NECK, LONG ISLAND. HERE ALSO WAS USED SOME OF THE HISTORIC OLD BONAPARTE HEDGE, AND OTHER BOX BROUGHT FROM THE HOME OF BARBARA FRITCHIE, THE INTREPID UNION PATRIOT, AT FREDERICK, MARYLAND, WHOSE BRAVE DEFIANCE OF THE CONFEDERATE FORCES HAS LONG BEEN TOLD IN SONG AND STORY



BOXWOOD—THE HOME OF CAPTAIN FRANCIS R. MAYER, OF HEWLETT, LONG ISLAND. HERE AGAIN ARE FOUND CLUSTERS OF THE FAMOUS OLD BONAPARTE HEDGE, LENDING A DELIGHTFULLY OLD-TIMEY LOOK TO THE BEAUTIFUL GROUNDS

faded from most minds, but when the evening shadows creep across the Sound, the ghosts of the old days, it is said, steal out into the lengthening shadows from the depths of the old hedges and relive the days when the happy bride and her dark eyed husband planted and cared for their sturdy box hedges, little thinking that they were planting a memorial to their love.

The largest share of the old Bonaparte hedge was taken to the country estate of Edgar F. Luckenbach, Elm Court, on the North Shore of Long Island; while the other parts of it embellish and lend charm to the gardens of Mrs. Henry Phipps, W. R. Coe, E. T. Stotesbury, in Philadelphia; Mrs. Robert Lowe

Bacon, Dr. E. R. Campbell, and at "Boxwood," the Long Island home of Captain Francis R. Mayer, at Hewlett.

Not all boxwood boasts such a romantic history, but most of it is steeped in the charm and folklore of other days, and for this reason boxwood demands enormous prices. Three thousand dollars has been paid by one land owner for a few box bushes of historic value.

Another charming story of boxwood is told of an old colored man near Harper's Ferry. "Near this historic spot in the Civil War, we found a beautiful lot of box

cialize in supplying many of the box gardens of the North, stated that owing to the demand for this, the favorite of all hardy shrubs, fully seventy per cent of the old plants of the South have been brought up and transplanted in the North, and that practically all of that which grew on Long Island and in New Jersey, has been collected and transplanted to other gardens where it lends its beauty and old fashioned charm. This company of landscape contractors has at its nursery some wonderful specimens and one of the largest collection of box in the country. Recently one of the beautiful old historic gardens of the South has given up a boxwood hedge which has been sent north to enhance, with its beauty, some of the large Long Island estates. A recent writer has given us the story of the romance which clings about this famous hedge. It is the tragic story of Betty Patterson, of Baltimore, and Jerome Bonaparte, the handsome and dashing brother of the great Napoleon. Together they planned and planted their garden with its boxwood hedges about the charming spot where they spent their honeymoon. Now the old residence is a thing of by-gone days for it has been made a part of Johns Hopkins College, but the old boxwood hedge still retains its identity although ruthlessly torn from its place, and is known as the Bonaparte hedge. The tragic story of this old love affair has



A GARDEN ON THE ESTATE OF E. T. STOTESBURY, AT CHESTNUT HILL, PENNSYLVANIA. SHOWING WHAT MAY BE ACCOMPLISHED BY THE USE OF MATURE TREES AND SHRUBBERY IN READILY SECURING AN APPARENTLY LONG-ESTABLISHED PLANTING

in front of an old log cabin. The father of the old negro who lived in it had been a slave on a large plantation in the neighborhood and after emancipation had bought a small piece of land, built his cabin and started life over again. It was very primitive but the one touch of nature was the boxwood which he had been accustomed to see from a boy and which the old man had not forgotten to plant in memory of that up at the big house.

"The plants were particularly fine specimens and had evidently been unusually well cared for by people in their circumstances so I questioned the old man about it. He told



THE FASCINATION OF OLD BOX IS A VERY TANGIBLE ONE. LIKE THE LURE OF THE ANTIQUE TO THE COLLECTOR, AND VAST SUMS ARE PAID FOR IT. THIS IS A FINE OLD BOXWOOD PLANT READY TO BE SHIPPED FROM THE LEWIS AND VALENTINE NURSERIES AT ROSLYN, TO BE PLANTED ON THE RUPPERT ESTATE AT GARRISON, NEW YORK

me he valued that plant more than anything else, for old associations' sake and he meant never to part with it. When I suggested buying it he was insulted, but, after persuasion and when I agreed to pay for it more than the whole house and grounds were worth, he softened and finally agreed.

"But the day we hauled it away the old man and his wife and children, his fourteen grandchildren and the whole neighborhood beside lined up along the road watching us take their old boxwood plant away. It was more like a funeral than anything else and I was mighty glad when we could see them no more."

TREE SURGERY DESERVES MORE ATTENTION

At present tree-repair work has not received the recognition and approval from tree owners that it deserves. This may be due at times to unfavorable experiences with dishonest or ignorant tree surgeons, at other times to the reluctance of the owners to spend much money in preserving their trees, or from their ignorance of the benefits that may result when tree-repair work is properly done.

Reliable tree surgeons are doing much in a practical way to educate the public as to the benefits of tree-repair work. A few States have laws regulating tree-repair work on a commercial basis.

The United States Department of Agriculture invites correspondence concerning methods of tree-repair work and is prepared to advise for or against any particular method so far as experience and the results of experiments permit. Farmers' Bulletin 1178, on tree surgery, will be sent free on application.

Tree owners are urged to remember that the necessity

for tree repair work 10 or 20 years hence may be reduced materially by promptly attending to the fresh injuries of today.

Most persons can at least with a very little preliminary practice on the simpler types of work, undertake ordinary tree surgery provided they are familiar with the use of a gouge and mallet, a saw and a paint brush. A steady head and ability to climb will be necessary for work in the top of the tree.

A badly diseased or injured tree should be removed and replaced by a healthy one unless there is some very special reason for trying to preserve the tree.

Two axioms of tree-repair work that should be borne in mind constantly are: that prompt treatment of freshly made wounds is the surest and most economical method of preventing disease and decay in the future, and that all wounds made in tree surgery should be cleaned, sterilized and protected from infection just as thoroughly as in animal surgery, and for the same reasons.

PAGAN

BY McLANDBURGH WILSON

I would be young as the trees are young,
Open to glimpses of stars blue hung.

I would have prime as the trees have prime,
Wrapped in myself from the winds of time.

I would grow old as the trees grow old,
All in a glory of red and gold.

Then I would fall as the trees will fall,
Showing how straight I have lived and tall.

LEHIGH UNIVERSITY TREE PLANTING

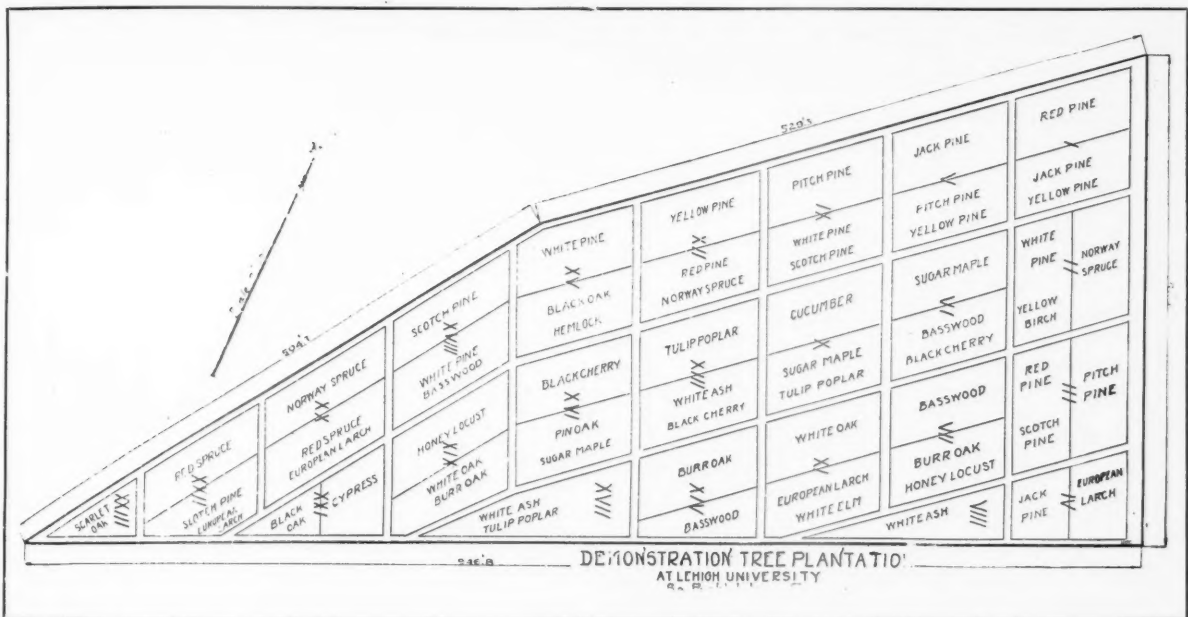
IN the spring of 1915 Lehigh University started an experiment in tree planting for the purpose of showing the development of different species of trees best suited for forestry in Eastern Pennsylvania. A tract of land, five and a half acres in extent, on a hill back of the University campus was used for the planting, the details of which were described by Dr. N. M. Emery, vice-president of the University to members of the Pennsylvania Forestry Association at Foxburg, Pennsylvania, in June, 1915.

In order to have the most expert advice obtainable in developing this project President Henry S. Drinker, of the University, conferred with two men who had for years given unstintingly of their time and energy to the consideration of problems affecting forestry conditions in Pennsylvania and throughout our country, men

tree plantation is located on a gently sloping mountain side of approximately 900 feet elevation; at places the soil is good, at other places it is thin or rocky. The land is entirely unsuitable for agricultural or even grazing purposes, and is typical of thousands of acres of Pennsylvania mountain land waiting to be reclaimed by scientific reforestation.

All of these features, together with the prevailing winds and the relative position of the highway, were taken into account by Dr. Rothrock and Mr. Elliott in making their plan.

The following trees were planted: 500 jack pine, 400 scotch pine, 500 white pine, 500 pitch pine, 400 red (or Norway) pine, 400 western yellow (or bull) pine, 400 European larch, 500 Norway spruce, 100 red spruce, 100 hemlock, 100 yellow birch, 400 bur-oak, 300 black



of international reputation of whom all foresters are fittingly proud—Dr. J. T. Rothrock, of West Chester, first Commissioner of Forestry of Pennsylvania, and the late Hon. S. B. Elliott, of Reynoldsville, of the Forestry Reservation Commission, the Nestor of the foresters of the State. These two men cheerfully and enthusiastically undertook the task of determining how this tract could best be laid out for the desired purpose.

First of all a careful survey was made, the tract was cleared of the scrub growth, and a mesh wire fence erected around the entire property except the side immediately adjoining the University's Arboretum, the posts being obtained from the scattered trees which had to be removed in order to put the plan into operation. Incidentally it is interesting that enough was realized from the sale of cordwood to meet the expense of clearing the ground, and of planting the new trees.

The land which was set aside for this experimental

oak, 100 pin oak, 300 white oak, 400 sugar maple, 600 tulip poplar, 600 basswood, 700 white ash, 300 wild black cherry, 100 elm, and 300 honey locust, a total of 8,000.

In order to make the experiment scientifically valuable, seedlings of the same age were secured, most of them being furnished by the State nurseries. This experimental tree plantation was the beginning of a practical scientific experiment, so far unique in this country, which is bound in ten, twenty and fifty years to be productive of information of great value to the forestry interests of Pennsylvania and of the country at large.

Mr. S. B. Elliott said of the work: "The main cause which led me to recommend the establishment of a Demonstration Plantation of trees that are of economic importance for the production of needful forest products was, that thus far, in this country, we have been without practical knowledge of forest growth, and the adaptation of species to locations and environments; and hence,

all has been largely, if not wholly guess-work. Another reason was that if a plantation of that kind were established where it could be seen by the public at large, and where the several species of our timber trees could be seen in proximity to each other, deductions could be drawn without having to investigate forests remote from each other, and where climatic and local conditions might vary, and it would have a great educational power. Besides all this there was present in my mind the great advantage to foresters of the future who could see what those of the present day were unable to ascertain—the adaptability of certain species to certain soils, location, and environment—and thus have set before them an object lesson of great value.

"As there exists a difference of opinion among educated foresters as to whether pure or mingled stands are best, Dr. Rothrock and I arranged the planting so that one-half of each compartment should be of one species only, and the other half of the same compartment of mingled species of various kinds, so that the forester of the future can see which is best in like situations. It is but proper to state that we fully agreed on all details, and if there should prove to be a failure we two, alone, are responsible.

"For this good work, this painstaking, generous, patriotic, financially unremunerative work, we are indebted to the farseeing wisdom of the donor of the necessary funds to carry it on—a donor who stands unknown to the public which is benefited by that wisdom and liberality."

Dr. J. T. Rothrock, following Mr. Elliott's comment said that, in his opinion, "it was a most important educational move, not simply because of its association with a great educational institution, but because also of its relation to the whole forestry problem of the State and Nation.

"The soil upon which this plantation is made represents fairly the character of the millions of acres upon which Pennsylvania's future forests are to grow, if grown at all. It is non-agricultural land, upon which timber has once grown. Whatever is possible there is possible elsewhere in our State. Furthermore, this same plantation, it is hoped, will help to solve for our region the relative merits of different methods in forestry procedure, for we may safely assume that they will be fully 'tried out.'

"Our hope is that Lehigh University will enlarge the area devoted to this productive line of work, because there is an assurance that a well-considered plan will be followed to its natural results; an assurance which, unfortunately, cannot be positively counted upon for any State operation."

This gives the account of the start five years ago, in 1915, of this experimental plantation. Now at the end of 1920, Dr. Rothrock was called on by the University to make a report on the development of the plantation which has had, during the five years, the unremitting and careful oversight and attention of the University Superintendent of Grounds, J. C. Cranmer, a forester of experience and good judgment.

The following is a copy of Dr. Rothrock's report: "For the purpose indicated the land on which the trees

were planted is in many respects ideal, because poor and unpromising as it is, it fairly represents vast areas which the State of Pennsylvania must, in self-protection, cover with such forests as it can produce, or allow it to remain an open, corroding ulcer on the surface of the Commonwealth. There is no choice beyond these alternatives. The State is now, for the first time, seriously contemplating the magnitude and the importance of the problem presented. By use of artificial fertilizer, and by weeding out or cutting back all undesirable, competing growth, a much more vigorous growth of the desired species could have been obtained, but it would have vitiated and rendered the experiment devoid of any great practical purpose. No seedling planted was more than six inches high. When it was put into the ground, it was allowed to take its chance of life in competition with whatever else grew there. That any of it survived and outgrew and overtopped the competitors, was a test of fitness for such land.

"There is one special fact that merits full consideration. The year 1919 was a locust year. In the absence of living chestnut, the weight of the attack fell upon the hardwoods. The oaks suffered most severely. Among the conifers, the European larch was probably the most injured, though the damage done to it was comparatively small.

"There were twenty-two species of trees planted. Looked at from the light of five years' experience, it is evident that a better selection of trees could have been made. There were certain trees, we felt, had a fair chance. There were others about which we were in doubt, but the very purpose of the experiment was to remove the doubt, and to ascertain what was possible under the conditions.

"The following brief paragraphs will give the essential facts concerning each species planted.

1. The jack pine (*Pinus Banksiana*) is vigorous, and has made an average growth of at least six feet.
2. Scotch pine (*Pinus sylvestris*) vigorous. Made growth of six feet. When planted in combination with white pine, it overtopped the latter. Tract partly burned over.
3. White pine (*Pinus Strobus*) badly burned. Shows now on the fire ground a growth of three feet. It may recover.
4. Pitch pine (*Pinus rigida*). In good, satisfactory condition. Average growth five feet.
5. Red or Norway pine (*Pinus resinosa*). Vigorous, but has made only three feet of growth. Usually it is a more rapid grower.
6. Western yellow or bull pine (*Pinus ponderosa*). Has made slow growth; hardly more than one and a half feet. Success doubtful.
7. European larch (*Larix Europaea*). This tree has probably the best showing on the ground, making, in open spaces, a growth of seven feet, though somewhat suppressed in places by chestnut and sumac sprouts.
8. Norway spruce (*Picea Abies*). Growth but twenty inches to two feet. Seems to be healthy, and may possibly do better, but present rate of growth is unsatisfactory.
9. Red spruce (*Picea rubra*). Growth one foot ("growing more slowly in cultivation than any other spruce tree"—Sargent), seems to be healthy.

"The above all are cone-bearing trees. They seem, on the whole, to have been doing better than the "hardwood" and broad-leaved kinds which follow, and which have suf-

tered severely from invasion of locusts in 1919 and fire in 1918, which facts must be carried in mind when deciding on the degree of success of each particular species.

10. Hemlock (*Tsuga Canadensis*). The seedlings sent were in bad condition when delivered. They were planted and a few came up, but were all destroyed later by fire.

11. Yellow birch (*Betula lutea*) has made an average growth of four or five feet, in spite of the fact that it was badly cut by the locusts. The black or sweet birch grows naturally into tree size on the ground.

12. Bur-oak (*Quercus macrocarpa*). Badly burned and badly scarred by locusts, but has made a growth of three feet. Under normal conditions it promises to be a fair success.

13. Black oak (*Quercus velutina*). Grows naturally on the ground and its condition is about the same as the bur-oak. Badly scarred by locusts.

14. Pin oak (*Quercus palustris*). Seems to have been somewhat less successful than the above named oaks in the contest with fire and locusts.

15. White oak (*Quercus alba*). Has made a poor showing. So far as I could see, it has been blotted out by fire and locusts.

16. Sugar maple (*Acer saccharum*). Made an average growth of two to three feet in spite of the fact that it was badly cut by the locusts.

17. Tulip poplar (*Liriodendron Tulipifera*). Practically suppressed by fire and locusts, though a few straggling specimens remain.

18. Basswood (*Tilia Americana*). Some small specimens surviving. The best mixed in with wild black cherry. Success doubtful, though fire and locusts responsible, in part at least, for failure.

19. White ash (*Fraxinus Americana*). Generally growing. Three or four feet high, in spite of fire. At present, its worst foe is the sweet birch, with which it is competing.

20. Wild black cherry (*Prunus serotina*). Grows naturally to tree size on the ground.

21. Elm (*Ulmus Americana*). No note of it. Apparently wiped out by fire.

22. Honey locust (*Gleditsia triacanthos*). Destroyed by fire. No seedling of short-leaved pine, cucumber, or bald cypress, originally contemplated for the plantation, could be obtained and no scarlet oak was planted.

"Of the twenty-two species planted, there are six species of cone-bearing trees which may be considered as having made good, and four species which remain in doubt.

"Among the broad-leaved, or hardwood, trees, we know definitely that there are four that can be depended upon as suitable for planting on sites similar to the one we are considering; namely, black and rock oak, sweet birch and wild black cherry.

"There remain among the hardwood species listed, eight absolutely in doubt, because in two successive years, visitations (fire and locusts), either one of which frequently kills or seriously hinders the trees in question, came upon them. The chances are that some, at least, of these doubtful forms would have risen above and overtopped the brush with which they were contending.

"In view of the facts, it may be safely said that all of the species planted could have made successful growth if treated with special care, but that would hardly have been a forestry test, because it is not applicable over extensive areas. The object of this experiment is to determine just what species can grow in such soil in competition with other less desirable species, and overtop them."

"The interest of Lehigh University in the pressing

problem of a future supply of timber for the needs of Pennsylvania is earnest and practical, as shown by the fact that in addition to the demonstration area, the University, under the judicious suggestion of the President, Dr. H. S. Drinker, purchased an adjoining tract of six acres for an Arboretum for the growth and exhibition of desirable timber trees. There are now growing in that tract thousands of seedlings of pines, larch, spruce, firs, arborvitae, oaks, tulip-poplar, ash, birches, beech, magnolias, dogwood, elm and others. Also a large number of trees of various ages.

"In the clearing up of the forest tract, known as Sayre Park, the University has planted on its ground upwards of sixty-five thousand forest trees.

"The University Campus and Park, Arboretum, and Demonstration Plot, cover about 175 acres. The clean, healthful condition of the trees is evidence of judicious treatment by their caretaker, Mr. J. C. Cranmer.

"The Demonstration Plot was purchased, then laid out and planted under the direction of the Hon. Simon B. Elliott and myself in 1915; since which time five years have elapsed. The average observer may think the growth shown is insufficient, but it is to be remembered that the largest seedlings planted were six inches high; the majority were less. In addition, the locusts and the fire have done their destructive work. As a forestry proposition of especially important character, it should be continued as a testing ground to discover what species of trees may most surely be depended upon to grow on the vast, abandoned areas of like soils in this State. It is an open question for those in charge to decide, whether it should be continued in the strictest sense as a testing ground, upon which seedlings from three to five years old should be set out and take their chance of growth in competition with other established native trees; or whether the seedlings should be more tenderly cared for and favored in their life struggle. The latter method, no doubt, can be made to render more striking, immediate results. The former method, if rigorously conducted, will win no applause as an illustration of neat, or clean forestry; but in the long run, it may save much labor and much money if the individual foresters over the State know just what species of trees can best be depended upon to force their way up above the underbrush and become marketable timber. No institution in Pennsylvania can more appropriately than Lehigh University conduct and continue this practical work which it has commenced."

It is the intention of the Lehigh University authorities to continue this demonstration plot as a testing ground of timber growth under purely natural conditions, and to plant new seedlings to replace those destroyed by locusts or fire, or by causes other than those properly and ordinarily pertaining to the plant struggle for life among competing natural growths. Those planted to supply the places of those eliminated since the original planting in 1915 are of course being carefully catalogued, and their history chronicled to the end that this Demonstration Plot may serve as a continuing study of survival of our trees under natural conditions.

THE FORESTRY BILL IN CONGRESS

CONGRESSMAN B. H. SNELL, of New York State, has introduced the National Forestry Program Committee bill in Congress, and the first hearing on it took place on January 26 before the Agricultural Committee of the House. Bill H. R. 15327 is supported, as has already been told in AMERICAN FORESTRY, by practically every organization interested commercially or otherwise in the forests, including conservation associations, lumbermen, timberland owners, chambers of commerce, pulp and paper manufacturers, the newspapers, wood-using industries, etc., and is approved and endorsed by the American Forestry Association.

A hearing before the Subcommittee on Appropriations, Representative Anderson, chairman, on January 7, was attended by many supporters of the Snell bill, on account of the presentation of arguments for the \$1,000,000 item for fire protection and the \$10,000,000 item for forest acquisition, under the Weeks Law, which are somewhat similar in policy to those in the Snell bill.

Col. W. B. Greeley, making the introductory statement on behalf of the United States Forest Service said that the problem of fire prevention was the first step toward the reforestation of the nation's idle acres, for a large portion of the forest land would be naturally reforested if it were given protection against fire. The need for fire prevention was shown to be of the utmost importance, not only because of the protection of the growing forests, but because of the manner in which the timber of the country is now being cut four times as fast as new timber is being grown. The forest fire losses annually, Colonel Greeley said, were an inexcusable waste, and every dollar expended in preventing fire was an important element in the production of the nation's future timber supply. This he said was most important in the regions where there was not now much work being done by the States on their own account. Colonel Greeley

pointed out that the bill proposes to allot money only to those States which are protecting their own forest areas, and that no money be expended in excess of the amount of money expended by the States receiving Federal aid.

Alfred Gaskill, State Forester of New Jersey, speaking for twenty-one State Foresters who have formally declared themselves in favor of the program for fire prevention,

said that others were known to be in favor of the item who had not been included in the list reached by the State Foresters Association Committee. J. S. Holmes, State Forester of North Carolina, and other State Foresters declared in favor of the measure.

E. T. Allen, representing the Western Forestry and Conservation Association, the National Lumber Manufacturer's Association, and with credentials from the Governor of Oregon, spoke on how co-operation with the Federal Government is effected in the western districts, adding that the private owners in the west spend annually over half a million dollars protecting their own and adjoining land from fire, with much heavier expenditures in bad years. He said that Federal aid would also assist in taking more effective measures to prevent fires throughout all the regions affected, and would increase, not decrease the amount of attention paid to their holdings by private owners. He said that in some States patrol of forest land was required by law, and that the owners believed that fire protection should be by co-operative measures of Federal and State Governments and pri-



Harris & Ewing

REPRESENTATIVE BERTRAND H. SNELL, FATHER OF THE FORESTRY BILL

vate owners, and not be handled through separate measures which might overlap.

A strong statement on behalf of the National Forestry Program Committee, which includes the nation's paper industry, lumber manufacturers and wholesalers, newspaper publishers, wood-using industries, forestry associations and technical foresters was made by R. S. Kellogg, chairman of the committee, when he said: "The Na-

tional Forestry Program Committee, while organized to secure a comprehensive forest policy for the nation, wishes to declare its position as being for this appropriation bill, as being one of the important items of its own program."

D. L. Goodwillie, of Chicago, who appeared for the National Box Manufacturers' Association, and for the Chicago Association of Commerce, told how they are interested in protection of the nation's lumber resources, as a general economic necessity.

Philip W. Ayres, of the Society for Protection of New Hampshire Forests, spoke on behalf of State Forestry Associations, and P. S. Ridsdale, Secretary of the American Forestry Association, declared that the public in general demanded a national forestry policy, of which fire prevention was an essential item, because of the manner in which the entire nation is dependent upon the

product of the forests, for every type of home and business necessity, not forgetting the houses in which they live. Attention was called to the fact that the timber comes from the sparsely settled States, and is consumed by the centers of population, thus making the problem national, not local.

Other speakers were Harris Reynolds, of the National Fire protection Association; Harvey N. Shepherd, president of the Massachusetts Forestry Association, Don Hapgood, of the Springfield, Massachusetts Chamber of Commerce; C. W. Whittlesey, of the New Haven, Connecticut Chamber of Commerce; Major W. M. Jacoby, of the Pittsburgh Flood Commission; Major W. L. Hall, of Chicago; W. A. Babbitt and John Foley, of the Association of Wood-Using Industries, and Carlisle P. Winslow of the Forest Products Laboratory.

YIELDS OF ALCOHOL FROM WOOD WASTE

SOFTWOOD lumber mill waste can be made to yield twenty gallons or more of 95 per cent alcohol per ton, and hardwood waste about half as much, says the United States Forest Service. Some actual yields obtained by the Forest Products Laboratory, Madison, Wisconsin, from the waste of various woods are given in the following table:

SOFTWOOD WASTE

Kind of wood	Percentage of wood convertible into sugars	Percentage of sugars fermentable	Gallons of 95% alcohol from 1 ton of wood
White Spruce.....	23	71	25.8
Longleaf Pine.....	23	72	25.1
Red Spruce.....	22	72	24.0
Norway Pine.....	25	66	23.4
Idaho White Pine.....	21	74	23.4
Western Hemlock.....	21	77	23.0
Montana White Pine.....	20	75	22.0
Lodgepole Pine.....	21	67	21.8
Sugar Pine.....	20	66	21.5
Douglas Fir.....	21	67	20.7

HARDWOOD WASTE

Silver Maple.....	20	47	14.1
Birch.....	20	46	12.9
White Oak.....	17	50	12.4
Red Gum.....	20	38	11.0
Sycamore.....	18	38	9.7
Hard Maple.....	18	34	9.1
Red Oak.....	19	30	8.1
Cottonwood.....	18	30	7.2
Slippery Elm.....	16	26	6.0

The manufacture of industrial alcohol is at present about the only feasible method of utilizing lumber mill refuse on a large scale. An alcohol plant with a daily supply of 180 tons of wood can produce 3,600 gallons of alcohol at a cost, under present conditions, of approximately 25 cents a gallon. The success of plants now in operation justifies a serious consideration of this process by mills having a large quantity of waste. A descriptive pamphlet including estimates of plant requirements and recent cost data on the manufacture of alcohol from wood is obtainable from the Forest Products Laboratory on request.



A HUGE WHITE PINE TREE

A few years ago the Central Pennsylvania Lumber Company, Sheffield, Pennsylvania, felled this large white pine for lumber. The base of the tree measured 26 feet 10 inches in circumference. There were four large prongs and one small one. When felled, the logs scaled in excess of 15,000 feet board measure. The tree was cut on what is known as Warrant No. 2034, Highland Township, Elk County, Pennsylvania.

IN 1850 New York ranked first among the States in lumber cut. It now contributes only one per cent of the total. That's what comes of emptying the bucket but never filling it up.

FOREST GUIDES DEPARTMENT

SOLAN L. PARKES, EDITOR

The Boy Scouts of the United States are rapidly enrolling as Forest Guides. In a short time it is expected every troop will be a member. The Editor of this department, now Chief Forest Guide for Pennsylvania, will furnish in "American Forestry" Magazine each month information, advice and instruction to the Forest Guides, and hopes that this department will soon be read by every Boy Scout in the United States.

FOREST GUIDES can do no more important work than prevent forest fires, extinguish them and report to the authorities the names of people starting forest fires.

In many of the States the spring and the fall are the periods when most forest fires occur, and this month is the time for Forest Guides to learn the cost of forest fires and how to guard against them.

No better instruction in these respects can be given than that of C. P. Wilber, state firewarden of New Jersey, who says:

Fire not only destroys our homes and buildings, but burns up, in our forests, timber, which would make thousands of homes, wasting it before it has been made into lumber, or into paper and the multitude of other things for which we use wood in our daily lives. It has been said truthfully that every year there is more lumber burned up in forest fires than all of America's sawmills manufacture in a year.

Besides this awful waste, these fires cost many human lives, cause untold suffering and do millions of dollars damage by destroying crops, and homes and even whole towns. They likewise kill multitudes of birds and wild animals and drive away those which escape by ruining their homes and feeding grounds. Also the blackened wrecks of woods drive away and keep away all sorts of people; the woods worker, the home seeker, and the pleasure seeker. They leave the countryside a deserted waste, idle and unproductive, and worst of all, it must stay so for years. The ruins of the biggest fires in our cities are replaced by new buildings in a few months or at longest in a year or two, but it takes from 30 years to 150 years to rebuild a ruined forest.

Too many people believe that the little fires crawling among the leaves or burning quietly in the underbrush are harmless. And yet they in-

jure even the larger trees and kill the young growth and seedlings from which the next forest must come, they also rob the forest of nature's sponge for holding moisture and her fertilizer for feeding the trees, by burning up the humus. No fire is so small that it is insignificant or harmless. A few moments spent by some "good citizen" who finds one will certainly prevent some damage. It will often avert a big conflagration, for any such fire, if left untended, is more than likely to be caught by some sudden gust of wind or to reach more inflammable cover and become a roaring furnace.

Like other fires, nearly all forest fires come from someone's carelessness or ignorance. Here are two examples from actual occurrences which show two of the main causes of fires and how easily they may make trouble.

A fire recently burned up more than 2,000 acres of fine woodland. When the man who was responsible for it was found this was his story: "It was an absolutely quiet morning and I had just a few weeds and briars to get rid of after cleaning up the garden, so I lighted them and watched the fire carefully. When it was almost burned out, there came a sudden whirl of wind and the fire seemed to scatter and start up everywhere at once, so that I could not put it out before it got to the woods and got too big for me." This man had never heard that it is always unsafe to start a fire for any purpose near the woods or fields when things are dry, and especially so in the spring and fall. He didn't know that it is always more dangerous to build a fire in the morning than in the evening. He'd never learn that even on the quietest day, a little fire may start the air to move or that the wind will often suddenly change direction or grow stronger. He had neglected to have water or a shovel or even something to beat out fire handy in case the unexpected did happen. He didn't realize that, for even the smallest fires, grass and leaves should be raked back so that there is a big ring of soil around the fire. He

had never been told that there were cheap and safe "rubbish burners to be had for just such purposes. Because he was so ignorant he had done what hundreds of others do every year with bonfires, campfires or even when "cleaning up," he had made a graveyard full of blackened tombstones where a forest had stood. Remember the mistakes he made when you have anything to do with such fires.

A good sportsman, used to the woods all his life and very careful in every way, said: "I was out after rabbits last fall with a new dog and while waiting a moment for him to jump something, I lit my pipe. Just then he let out a yelp and I went on to see what he had started. He'd found a deer trail and gone off on it and I couldn't call him back, so I turned homeward, and right where I'd lighted my pipe, found a little fire getting under way. It was quiet so that I got it out in a short time, but that taught me a lesson, for I've always thought I was as careful as a man could be." If this man's dog had jumped a rabbit instead of finding the fresh deer track, there would have been all the destruction of forest and game which forest fire does, and no one, least of all the man who started it, could have told how it happened. This man's accidental

fire is similar to thousands set each year by smokers who throw away lighted matches, cigarettes, cigars or pipe tobacco from car windows or automobiles or as they tramp the woods and roads. Don't guess, but always know that match is out before you drop it anywhere. Don't ever be in such a hurry that you fail to tramp discarded "smokes" into the mineral soil before you leave, if there is any heat in them. Remember, dry grass or leaves are even more inflammable than papers in a waste-basket.

Most States now have firewardens or some similar organization for putting out forest fires.

People living near the woods or traveling through them should know who these men are and how to reach them just as in a city they should know where the nearest fire alarm box is and how to use it. Do you know who your local forest firewarden is?

Many States also require every one, setting fire for any purpose near the woods, to secure a permit from a firewarden before doing so. Those who plan to build fires should know whether such permits are needed and get one if they are, to avoid needless unpleasantness because of unlawful fires.

HAVE YOU?

BY ORVILLE LEONARD

Have you ever seen the smoke clouds from a forest fire burning? Have you ever lived for hours in that crackling, bright inferno? Have you had your shoe soles burned off by those dead looking white ashes? Have you seen men shouting wildly, though you could not hear their voices for the roar and hiss of leaping flames and the fierce wind they engendered? Have you ever looked down a line all hedged with living fire and wondered if you'd ever live to feel the cool wind blowing? Have you ever seen a rancher driven from his fired homestead, while years of labor on his fields were wiped out in an hour? Have you ever seen a country where the furred and feathered wild things have been burned up, every one? And have you seen that country when the fire fiend has finished—the blackened stumps of noble trees, the white ashes, burned bare rocks, no living thing—black, deathlike desolation brooding over all?

If you have, you'll see that your match is out and look where you throw your cigarette.

SAFETY RULES FOR FOREST FIRES

To Prevent Them

1. Never drop lighted matches or smoking materials in the woods or fields or along the roads without putting out the match absolutely or stamping the "smoke" into the mineral soil.

2. Never build an open fire for any purpose near the woods or fields when the woods are dry.

3. Never leave any fire until it is entirely out. Drench it with water or cover it completely with mineral soil.

To Control Them

1. Never pass even the smallest fire unnoticed. Put it out

yourself or see that a fire warden, the owner or some responsible resident starts for it before you leave.

2. Fire travels with the wind always. Stop its front first and put out the sides and rear later. Sand or soil will smother it, beating will kill it, but water is always best. Flirt water or soil along the line, do not dump it in one place. Beat toward the fire to avoid spreading it.

3. Always work slowly and deliberately in fighting fire so that every motion counts and your energy is not wasted.

HALL OF FAME FOR TREES

The old Fremont Oak in Alameda, California, has been nominated for a place in the Hall of Fame for Trees of the American Forestry Association. Three-quarters of a century after it had taken its share in the making of California history by providing shelter for Captain John C. Fremont, the old Fremont Oak, Alameda's historical landmark, received under its sheltering boughs another band

cause of its many large and beautiful oak trees, Encina being the Spanish name for the California black oak.

Al C. Benton, superintendent of parks in Alameda, estimates that the age of the tree is five hundred years, says the Oakland "Tribune." Its trunk is more than ten feet in circumference, and gnarled and twisted with age and almost hollowed out.



Photograph by Oakland Tribune.

BOY SCOUTS IN CAMP BENEATH FAMOUS FREMONT OAK, NEAR ALAMEDA, CALIFORNIA

of uniformed guests. This time, instead of being buckskin clad frontiersmen armed with the long barreled squirrel rifle of 75 years ago, it was a trimly-dressed band of Alameda Boy Scouts who were the old oak's guests. The boys were under the leadership of E. Harry Levy.

The old Fremont Oak is located on the Cohn estate, in the east end of Alameda, and in what was formerly the town of Encinal, so named be-

The first white possessor of the oak was the famous Peralta family. The Cohn family came into possession in the early '50's.

When Captain Fremont camped under its spreading boughs with his force of 62 men, including five Delaware Indians and the redoubtable Kit Carson, the United States and Mexico were on the verge of a war in which California was to pass out of the hands of the latter forever.

THE WASHINGTON HORSE-CHESTNUT AND A LOWELL LETTER

THE Washington Horse-Chestnut, near Bath Pennsylvania, pictured on the cover of this magazine, is nominated for a place in the Hall of Fame for trees by Asa K. McIlhane, of Bath, Pennsylvania, because the tree came from Mt. Vernon. General Washington presented it to General Brown, of Revolutionary fame, and General Brown planted it in front of his old home where the picture shows it today. The base circumference of the tree, Mr. McIlhane informs the American Forestry Association, is 27 feet and seven inches, while six feet from the ground the girth is 17 feet.

The horse-chestnut at Bath is the property of the Bath Portland Cement Company, and Mr. F. B. Franks, the vice-president, has presented this picture to the American Forestry Association.

Mr. McIlhane has a letter from James Russell Lowell, the poet, who was also born on February 22, the birth date of George Washington. The letter was written in regard

to the value of tree planting. It was written thirty years ago in April by the poet and former Ambassador to Great Britain, just four months before he died. The letter follows:

Elmwood, Cambridge, April 5, 1891.

DEAR SIR:

I sympathize warmly with the gracious object for the furtherance of which Arbor Day was instituted. I have planted many trees, and every summer they repay me with an abundant gratitude. There is not a leaf on them but whispers benediction. I often think of the Scottish farmer's words quoted by Scott: "Be aye stickin' in a tree, Jock, 'twill be growin' while ye're sleepin'." In my childhood I put a nut into the earth, from which sprang a horse-chestnut tree, whose trunk has now a girth of eight feet, and sustains a vast dome of verdure, the haunt of birds and bees and of thoughts as cheery as they. In planting a tree we lay the foundation of a structure of which the seasons (without care of ours) shall be the builders and which shall be a joy to others when we are gone.

I need not say how great a pleasure it is to me that my young friends should decorate my memory with a tree of their planting. I wish I could be with them to throw the first shovelful of earth upon its roots.

Faithfully yours,

To Asa K. McIlhane, (Signed) J. R. LOWELL.
Principal of Schools, Bath, Pennsylvania.



Underwood and Underwood.

CHILDREN OF THE DISTRICT OF COLUMBIA STUDY TREE LIFE AT FIRST HAND

Directed by Susan S. Alburtis, the nature study department of the schools of the District of Columbia has been studying the values of various trees, preparatory to taking a vote in the American Forestry Association's national referendum as to what should be the national tree of the country. Here the pupils are studying the elms on New Hampshire Avenue, near the Force School. The schools are taking up this educational campaign in many parts of the country, and the Association asks its members to push the work in their own towns. The newspapers are now printing series of lessons on trees and ballots for voting.

PROBLEMS IN FOREST EDUCATION

THE Second National Conference on Education in Forestry, held at New Haven, was well attended both by educators and employers of foresters, and furnished much food for thought. Two entire days were devoted to the presentation and discussion of committee reports on the more important problems in forest education now before the country. Several points stand out rather prominently as a result of these discussions.

It was the practically unanimous opinion of those present at the conference that five years of college work are essential for the preparation of a thoroughly trained professional forester, irrespective of the particular field of forestry in which he may later specialize. It was recognized, however, that not all prospective foresters can be induced to spend five years in preparing themselves for their work, and that it is therefore necessary to formulate courses which will crowd as many as possible of the more fundamental and essential subjects into four years. On the other hand, many foresters from the West Coast, who were prevented by distance from being present at the conference, expressed themselves by letter as believing that four years is ample time for the preparation of fully trained technical men. This divergence of opinion is perhaps due to differences in local conditions and opportunities for employment in the East and in the West. From a general educational standpoint it seems certain that five years is none too much to give a man a thorough grounding in such cultural subjects as literature, history, economics, and philosophy, in addition to his more strictly professional work, and that in general the best equipped man is one whose professional training follows a four-year course in the liberal arts. With the increasing complexity of civilization there is a constant tendency to turn for leaders to men whose training embraces more than the narrow field of their own specialty, and there is no reason why this tendency should not apply to forestry as well as to other professions.

Another point of interest brought out by the conference was the constantly broadening scope of the field of forestry. Until rather recently there has been a tendency on the part of the forest schools to turn out men trained primarily in the art of forest production, in silviculture

and forest management. The development of men to harvest the forest crop, and to serve as logging engineers, is now receiving increasing attention, particularly on the West Coast. The next step will undoubtedly be to prepare men who are specialists in forest products for the utilization of the forest crop. Other fields which are gradually being developed include forest entomology, forest pathology, city forestry, forest recreation, forest zoology, etc. Looking at forestry in the broad sense as co-ordinate with agriculture, there is no question but that all of these various branches are a legitimate part of the field and that men to handle them should be prepared by the forest schools. In our judgment there is no question but that the next ten years will witness a marked development away from the training of all foresters according to a single pattern, and toward the training of specialists in the various branches of the work.

The desirability of having forestry more generally taught as a cultural and educational subject in the high schools and colleges of the country was strongly emphasized. There appears to be a growing recognition of the fact that some knowledge of our forest resources and their place in the life of the Nation should be included in the education of the great majority of our citizens. It is to be hoped that some practical means may be found for a marked development along this line. Other subjects emphasized included vocational training in forestry for such positions as guards and rangers, the development of extension work with timberland owners and wood-users, and the prosecution of forest research as a regular part of the work of the forest schools of the country. Throughout the discussions the public service aspect of forestry was constantly mentioned and the need for imparting the public service point of view to the forester while at college accentuated.

Altogether it is safe to say that those who attended the conference went away with a broader vision which will not only aid them materially in their own work, but will react favorably on the education and general character of future generations of foresters. It is to be hoped that conferences of this sort will become a permanent feature of forest education in this country.

FOREST CONSERVATION IN TEXAS

THE long fight the Texas Forestry Association has waged for a more adequate forest policy for this State is beginning to show positive results. Governor Hobby has named 50 prominent men and women as a committee to draft bills, to be presented to the legislature, for dealing with the forest problem, an action that insures the careful attention of the next legislature to this important matter.

The appointment of this committee signals the beginning of a new era of forest preservation and renewal in the State. The legislature doubtless will not be able to accomplish everything that is desired or necessary at this

time, but a long forward step is certain to be taken, which will relieve Texas of the menace of an early timber shortage.

Lack of a constructive forest policy is threatening the destruction of the magnificent long-leaf, short-leaf and loblolly pine forests of East Texas. At the present rate of annual lumber cut, amounting to about 1,500,000,000 feet, by far the larger part of the virgin timber will have disappeared in ten to fifteen years unless an efficient and liberal reforestation policy is adopted. Originally there were 30,000 square miles of short-leaf pine in Texas, 7,000 square miles of loblolly and 5,000 square miles of

long-leaf pine forest. Out of this total of about 10,000,000 acres of virgin forest only 2,500,000 acres remain. Some of the large lumber mills have a sufficient supply of timber in sight to continue operations for fifteen years, but fully 80 per cent of all the mills will be without commercial timber in eight years or thereabouts.

Careful estimates prepared by the Texas State Department of Forestry show that out of 6,000,000 acres of cut-over pine lands in East Texas, known as non-agricultural lands because of the very deep sand which covers this area and makes it unsuited to farming, only 850,000, or 14 per cent, are supporting a second growth of timber from which the mills may hope to obtain a supply. Without sufficient funds to safeguard the standing trees against forest fires or to promote their planting and care, the East Texas forests face ultimate and speedy destruction unless steps are taken to correct existing evils.

A practical forest program, as outlined by S. O. Siecke, State Forester, provides for a practical policy of reforestation comprising more than 5,000,000 acres and yielding approximately 300 board feet per acre per annum, thus taking care of the demands made upon the timber stand by the 400 sawmills in East Texas. It will be plain to every thinking reader that there is no time to be lost to put into effect a consistent forestry policy in Texas, and safeguard one of the most important industries of the country.

Consistent progress in the work of reforestation has not been possible by the State Forestry Department because of lack of adequate funds. The sum of \$12,000 a year appropriated by the State is insufficient to meet the demands of controlling an area of 7,500,000 acres, with nine patrolmen employed by the State and two by the United States Forest Service. The Federal Government contributed the sum of \$4,250 this year toward forest protection in Texas.

It is not with an abstract matter that the legislature will be called upon to deal, but with a problem on which there are statistics and an abundance of authentic information which the committee will be able to present in support of their recommendations, and as a guide for their action.

VOCATIONAL TRAINING IN THE LUMBER INDUSTRY

PURSUANT to the plan of Melvin S. Lewis, State Director of Vocational Education, to introduce vocational training under the Smith-Hughes Act into the lumber industry in co-operation with the School of Forestry of the University of Idaho, Mr. C. E. Knouf, of the United States Forest Service, was engaged to study the situation in the mills and camps of Idaho and make definite plans for the organization of classes this winter. Following this preliminary investigation by Mr. Knouf, a class in lumber grading was organized at the plant of the Rutledge Timber Company, at Coeur d'Alene, and Mr. L. R. McCoy, sales manager of the company, engaged as instructor. At the first meeting 43 men reported for the course, including several men from the local office of the United States Forest Service. This was more than three times the most optimistic previous esti-

mate of the number of men who would desire to take the course, but after the outline of the work presented at the first exercise, it was still further increased when 60 men reported at the second meeting. This augurs well for the success of the vocational training plan in the lumber industry.

The course is outlined to include a history of lumber grading, characteristics of different woods and their identification from gross features, classes of defects, their cause and relative importance, grading rules and actual grading of the different species of the region starting with white fir of which only two grades are recognized and ending with white pine, the grading of which is most complex; then shop grades and finally the characteristics of the trees and methods of sawing to get the maximum proportion of high grade material.

Mr. Knouf is now investigating the logging end of the business in a similar way and it is planned to organize a class in scaling the first part of the year.

FOREST SERVICE RECEIPTS FOR 1920

IN spite of the fact that a depleted and over-burdened personnel made it necessary for the Forest Service to refuse at some places to take on new business, the receipts from the National Forests in the fiscal year 1920 exceeded those of 1919 by \$435,067.42 and set a new high mark of \$4,793,482, according to the annual report of Chief Forester W. B. Greeley. The year was also marked by one of the severest and most protracted fire seasons ever known, which necessitated the expenditure of considerable sums for the protection of the National Forests and required a deficiency appropriation of \$2,950,000 in addition to the regular funds provided for the purpose.

"The increase in receipts from timber sales," says the report, "reflects the increasing demand being made upon the National Forests as privately owned timber is exhausted and the forest industries move westward. If funds are provided for the examination and sale of National Forest timber now in demand, the receipts from timber sales may be expected to increase still more rapidly until the cut reaches the limit that must be imposed to maintain a continuous yield from the forests and give stability to the industries and communities dependent upon them."

In addition to the actual revenue, according to the report, there is an enormous return to the public through the protection of the 500 odd billion feet of timber for future use, the protection of the headwaters of innumerable feeders of navigation, irrigation and hydroelectric power, and the recreational facilities made available to hundreds of thousands of people. "There will always be national resources not measurable in dollars which in public benefit exceed the receipts paid into the Treasury," the report says.

During the fiscal year about one million acres in the Thunder Mountain Region of Idaho were added to the Idaho and Payette Forests. More than 654,000 acres in the Eastern States purchased under the Weeks Law were also proclaimed as National Forests.

YALE FOREST SCHOOL REUNION

THE Yale Forest School celebrated its second decennial reunion and the twentieth anniversary of its founding in December. Over one hundred alumni and students, or approximately 20 per cent of those who have received professional instruction at the school, attended the reunion. Old friendships were renewed, new friendships formed, the progress and present position of the school thoroughly discussed, and plans laid for the cooperation of the alumni in assuring it of a still more successful future. Perhaps the most important concrete step taken by the alumni at the reunion was the reorganization of the Yale Forest School Alumni Association on a more substantial and aggressive basis. It is anticipated that in its new form the Association will prove most effective in affording a medium of expression for the alumni and in bringing them into more intimate and helpful relations with the school.

The Yale Forest School first opened its doors for the training of professional foresters in September, 1900, and is the oldest forest school in continuous operation in this country. It is difficult now to realize that up to the beginning of the twentieth century the profession of forestry, centuries old in Europe, was unknown in the New World. Our forests, instead of receiving the careful treatment accorded a growing crop had, during the previous century, been cut, burned and abused on an unprecedented scale so that millions of acres were rendered barren for years to come. Valiant efforts had been made by a small group of far-sighted men, acting largely through the American Forestry Association, to stem the tide of destruction and ruin. They wasted no time on idle theories but struck hard for the one measure which seemed to promise immediate results,—the reservation and retention under public ownership of the National Forests so that the timber on these lands could be protected and managed as an object lesson to the public and as a permanent source of lumber after private holdings were gone. This object was attained in 1891, but for many years these lands were administered under the old political system then in force. There were no foresters in this country to furnish the trained executives needed if this new and promising innovation in Government activities was to succeed.

Under these conditions the Yale Forest School was founded by the Pinchot family primarily to provide trained foresters for the public service. At that time and for five years thereafter these forests were in the hands of the Interior Department. In 1905 however, they were transferred to the Department of Agriculture and their administration was taken over by the Forest Service, which at that time was under the leadership of Gifford Pinchot and was recruited in large part from the men trained at Yale. On Mr. Pinchot's retirement in 1910 he was succeeded by Henry S. Graves, under whom the Yale School had been built up. When Mr. Graves resigned in 1919 his successor was William B. Greeley, one of the older graduates of the Yale School. From

the very beginning, therefore, men connected with Yale have had an important part in shaping and administering Forest Service policies and activities.

Today, out of the five hundred and eighteen men who have received professional training at the Yale School, ninety-seven are employed by the Forest Service. Of these, twelve are engaged in research and eighty-five in administration. Thirty-eight, or nearly half of these men, are now in the office at Washington or in the eight district offices into which the National Forest Administration is divided, and have direct charge of the general policies of the Service in those districts. Twenty-six are supervisors, each in charge of a National Forest whose area averages over a million acres. In addition, there are thirteen men in other branches of the Government service.

Largely through the initiative, clear understanding, and devotion possessed by these trained men from Yale and other schools, a task was performed which would have been declared impossible in 1890. The hostile, independent, virile elements comprising the miners, stockmen, and farmers of the West learned within the short period of ten years between 1905 and 1915 that Government service could be made efficient, that regulation of timber cutting and of grazing for the common good was better than a mad destructive scramble to see who could get the most while it lasted, and that forest fires were not necessary but could be controlled and extinguished.

While the establishment and management of the National Forests came first in importance it was by no means the whole of forestry in America. The States were also developing an interest in forestry which was just as much in need of trained guidance. Today, foresters trained at Yale are in charge of the State Departments of Forestry in New Hampshire, Connecticut, Illinois, Maryland, Virginia, North Carolina, Tennessee, Louisiana, and Colorado, while nineteen others are employed as assistant foresters in these States and in Pennsylvania, New Jersey, California, Minnesota, New York, Texas, and Vermont. Only ten other States have practical forestry departments, and of these but four have employed trained foresters. These foresters have in every instance been active in building up efficient State systems of fire protection, and in developing public sentiment and knowledge of forestry, which in some States has led to considerable progress in the acquisition of forest lands by the States.

But perhaps the greatest service of the Yale Forest School is as the parent school from which forest education has spread throughout the country. Of the twelve leading forest schools, ten are under the direction of Yale men, and eleven have Yale graduates in their faculties. In addition, forestry is taught as a subject at four other institutions by Yale graduates. In all, forty-three men from this institution are engaged in training professional foresters in America.

The number of graduates engaged in forestry on pri-

vately owned lands is steadily increasing, with the awakening interest of land owners in their woods as a source of possible permanent income instead of a tax-ridden incumbrance. Paper and pulp companies show the greatest interest in forestry of any class of woodland owners, and are now employing fourteen Yale graduates. Others are working for manufacturing concerns dependent on wood supplies for their raw materials, including some owners of forest estates. A few fortunate ones are themselves forest owners and are putting into practice the principles learned at the School. In all, forty-three foresters are so employed. Six graduates are now in the tropics, Brazil, Dutch East Indies, and elsewhere, in private employ.

Yale has extended her influence widely. At present the Canadian Forest Service employs five of its graduates; South Africa, three; China, two; India, two, and New Zealand, one. The work in China is of special interest and the field enormous. Four Chinese have graduated from the School, to return to take up this work, and four more are now in attendance. Those in China report a great awakening of interest in forestry and many active measures under way for its establishment.

Fifty-five alumni of the School are engaged in lumbering and fourteen others are connected with various wood-using industries, from airplanes to tanning extracts. Another small group of ten men is working in connection with parks and city forestry. All told, seventy-nine men are connected with these industries allied to forestry.

The remaining men who have taken up other pursuits have apparently found that forestry gives a broad basis for success in many lines, for there are few of these ex-students who are not acquitting themselves creditably in their chosen lines. A group of sixty-three is engaged in dealing with the soil and its products, of which agriculture and horticulture claim fifty-five and geology eleven. Public service other than forestry claims twelve men. Commercial pursuits have absorbed seventy, of whom twenty-seven are in mercantile lines, thirteen in manufacturing, ten in finance, seven in insurance, five in real estate, and eight in miscellaneous trades. The professions include thirty-two, the largest group, twelve, being engaged in teaching, and the next, six, in engineering. Science claims three, law and medicine two each, and miscellaneous professions seven.

To summarize, sixty-one per cent of the alumni of the Yale Forest School are now engaged in forestry, or closely allied work. Thirty per cent are in direct public service, eight per cent each in forest education and private forestry, and fifteen per cent in forest or wood utilization and park or city forestry. These men are scattered to the four corners of the earth where they are doing their share to put into practice the principles and the ideals which they were taught at Yale.

THE Lake States now pay \$6,000,000 yearly in freight bills to import lumber for their needs.

THE LIBERTY TREE

SOIL from every State in the Union, from each of the Allied Countries and from other foreign places was placed about the roots of a maple tree planted by the Daughters of the American Revolution at Arkadelphia, Arkansas. The tree is a memorial to the soldiers and sailors of that city who answered their country's call. It has been nominated for a place in the Hall of Fame by Mrs. Thomas Sloan, historian of the Arkadelphia Chapter of the Daughters of the American Revolution, and it is pictured on the contents page of this magazine.

With an impressive ceremony soil from Izabella, at Santo Domingo, West India, the oldest settlement in the New World, as well as soil from the famous Sakakawea Statue on the Capitol Grounds of Bismark, North Dakota, which honors the "Bird Woman" who directed the Lewis and Clark Expedition, along with soil from under the old North Bridge at Concord as well as soil from Tilloloy, France, thirty-five miles from Paris that was destroyed during the war, were placed about the roots of this tree.

The tree is planted on the lawn of the Court House and is in a thriving condition. Every year, on Washington's birthday, the Daughters of the American Revolution will place a laurel wreath on this Liberty Tree.

BIRD AND TREE CLUB APPROVES

PLACING itself on record in favor of proposed forestry legislation, the New York Bird and Tree Club passed the following resolutions at its meeting on December 10, 1920:

WHEREAS, The forest resources of the United States are being consumed about four times faster than they are being replaced, and serious shortage already affects some industries and threatens others;

WHEREAS, Vast areas of timber lands, unsuited to agriculture, but capable of producing valuable forests, are being cut with reckless disregard of the future and being left as unproductive wastes which constitute a heavy and unnecessary loss affecting the welfare of the entire country;

WHEREAS, A supply of wood material is essential to prosperity in time of peace, and vital to the national defense in time of war, be it

Resolved, That Congress of the United States is urged to pass such legislation as will give the Federal Government ample power to check forest devastation, and to make sure that, while the interests of the forest owners are safeguarded, the forests are maintained in a productive condition.

ELECTRIC wires which touch trees can easily kill the most beautiful shade tree. This may be due partly to the work of the electric current, or to the wearing through the growing surface of the tree by the wire, which deprives the tree of its sustenance.

NATIONAL FORESTRY PROGRAM INDORSED

NORTH DAKOTA is not much on forests we gather from the Devil's Lake (N. D.) *Journal*, but North Dakota has no copyright on that situation, the American Forestry Association can announce without fear of contradiction. On this point the Devil's Lake *Journal* says: "The American Forestry Association at Washington, D. C., may be long on forestry but it is short on geography. Yesterday we received a circular from it urging us 'to save the forests now.' Will somebody kindly pass the forests." Why not start something in the way of tree growing in such States? At one time Indiana had the finest hardwood forests in the world. Out of an area of something more than 22,000,000 acres there are now about one and a half million acres in timberland. Thus North Dakota is not alone in these matters, Indiana being much the worse example because she at least had forests once. The editors of the land are awake to the need of a national forest policy. They have been carrying columns on this subject from the American Forestry Association. The Chicago *Tribune* is devoting a page a day to the methods it has been forced to use to get pulpwood from its own lands far back in Canada. The *Editor and Publisher* is hammering away at a weekly feature, "What are you doing for Forestry?" In this campaign editors have taken up every phase of the subject particularly since the formation of the National Forestry Program Committee which is directing united action for the bill introduced in Congress by Representative B. H. Snell, of New York State. Some of this comment follows:

New York Evening Post: "The greatest forward step in forestry in many years," as it is termed by AMERICAN FORESTRY, has been taken in this city. Years of agitation have culminated in a definite proposal for a national forest policy. Representatives of the most important lumber and paper industries, of the wholesale lumber distributors, newspaper organizations, wood-using industries and the general public met and reached a unanimous agreement. The purpose of the program is twofold: to

obtain a considerable extension of direct Federal activity in forest ownership and production and to further by Federal aid the development of a proper forest policy in the various States. It looks as if we were at last awake.

St. Louis Globe-Democrat: Only of late, it would seem, has the public mind been thoroughly aroused as to the imminence of

FORESTRY ASSOCIATION'S WORK

Springfield, Illinois, *Journal*: Work of the American Forestry Association is bearing fruit in the awakening of public interest in the subject of forest preservation and the planting of trees for the future. A recent compilation of editorial comment, published in the American Forestry Magazine, indicates how widespread this interest has become.

Owing to the fact that President-elect Harding has long favored a definite and constructive national policy for ending the timber waste and encouraging the growth of trees, it is taken for granted that the incoming administration will take action along this line. The new Congress has in it a large number of men who are in harmony with Senator Harding's ideas respecting the importance of this subject, and he will have able legislative help in the creation of a workable policy.

America has never been unfriendly to proposals for saving the trees, but it has been woefully indifferent. Until recently its people have not fully appreciated what is involved in denuding the forests and permitting so much land, suitable for little other than the production of trees, to remain idle. Now, however, they realize how necessary it is that the nation begin to repair the destruction and provide against a treeless future.

President Harding and Congress are assured that they will be heartily commended with the public's gratitude if they save the trees. What they do towards this will be appreciated and applauded.

the danger of forest depletion. We are steadily losing more than we are gaining or putting ourselves in a position to regain. For we are not putting back into the ground, in reforestation, what we are steadily losing by deforestation. And deforestation is an increasing and not a diminishing evil.

Dearborn Independent: The American forestry Association is performing a public service by persistently calling the attention of this nation to the need for a constructive national forestry policy. The depletion

of our forests is a matter of great concern, the significance of which has as yet been only partially grasped by the public. The high price of lumber and the scarcity of wood pulp for print paper are only indications of the price we will eventually pay if we refuse to heed the warning signals.

Mobile Register: The statistician can, and does, give us figures showing that if we do not adopt a policy of reforestation we shall, within a stated and remarkably short period, find ourselves without lumber. With the facts before us, we should be more than hospitable to the plan of the American Forestry Association, of which Charles Lathrop Pack is president, to give us a really national policy of forest protection and conservation, even though that plan calls for appropriation at a time when economy in national expenditures is our principal desire. Perhaps that is because we understand that there can be no economy in waste. There are few better ways to spend eleven million dollars than in the preservation and enrichment of our forests.

Troy Record: The rapid exhaustion of American forests furnishes a striking example of the ultimate results of wastefulness. Not many years ago our lumber supply was considered practically limitless. Our awakening is much belated.

Atlanta Journal: If American progresses as her needs require, the time will come when she will raise crops of timber as regularly as she now produces corn or apples or pecans.

Rochester Post-Express: Forest fires are burning up a vast lot of the wood we so much need. This ought to get special attention for the plea which Charles Lathrop Pack, president of the American Forestry Association, makes for protection of timber areas against fire.

Detroit News: The fact that forests are being leveled for the mills in this country at five times the rate at which the forests reproduce themselves has stirred the whole country. The plain consequence of events is to be a timber famine heaped upon the existing condition of shortage and high prices. This, unless nature be assisted in the work of replacement of timber trees.

Greenville (S. C.) News: The solution is to set all this idle forest land to work growing new timber. It is a task which calls for the united efforts of the Federal and State Governments as well as of the smaller communities and the individual owners of forest land.

BY EDITORS FROM COAST TO COAST

Indianapolis Star: It has dawned on the tree owners that there is such a thing as killing the goose that lays the golden egg; or, to be more specific, totally to destroy forests to provide paper for market. Even if the paper supply is short and its price high, the fact is realized that the time should not be hastened when there will be no wood pulp and no paper from that source. The Canadians of Quebec province have undertaken to plant two trees for every one that is cut down and to do it as soon as possible after the cutting. Last year 3,000,000 spruce trees and as many pines were planted. The two-to-one system universally applied would soon solve the reforestation problem.

Thomasville (Ga.) Times-Enterprise: A careful analysis of conditions presents the conclusion that lumber in this country is being used up at a rate of about four times that at which it is being produced. The commercial association and other organizations might take up this problem along with its agriculture and hogs and make permanent forests while it is making permanent pastures.

Salt Lake City News: Among the important measures presented to Congress is a bill outlining a comprehensive national forest program, including better fire protection for the forests. Provisions of the bill have been worked out by a committee widely representative of those directly interested in the welfare of the forests, including the general public. According to Charles Lathrop Pack, president of the American Forestry Association, it is really the first united move in this direction in the history of the country. Endeavors have long since been put forth for preservation and control of the forests, but not in the comprehensive and far-reaching proportions that the proposed new law contemplates. The bill calls for national appropriations of not less than \$11,000,000 a year. Not until the comparatively recent past has the seriousness of the deforestation of this country been brought home to the people. And even now there are many who do not realize how much the condition of the forests means to American industry and welfare, nor the need for strenuous efforts to prevent complete destruction of the forest resources.

Milwaukee Journal: The national government is asked to appropriate \$10,000,000 a year for five years to increase the nation's forest reserves, to reforest its own denuded lands and make forest lands continuously productive, and to spend \$1,000,000 a year in assisting the States to protect forests

not owned by the national government. These proposals are features of a program that is sponsored by the American Newspaper Publishers' Association, the American Pulp and Paper Association, the National Lumbermen's Association, the Association of Wood Using Industries and

A CANADIAN VIEW

The American Forestry Association calls the attention of the country to the view Canada takes of her forest resources as reflected in the Montreal Daily Star. The editorial follows:

PRESERVE OUR FORESTS

"If what is lost in forest fires could be evaded the entire debt of the Province would be paid off in fifteen years."—Premier Taschereau.

Montreal Daily Star: One of the greatest assets of this Province is the forest, and it is shameful that fire should work such havoc with it. Our forest areas, the envy of other countries, are being depleted not so much by the woodman's ax as by negligence and lack of closer forest supervision.

In his address before the Board of Trade, Mr. James White, deputy head of the Commission of Conservation, also earnestly warned that our forest reserves were not inexhaustible and that more effective efforts would have to be put forth to protect forests from fires and insect pests. The interesting statement was made by Mr. White that the depletion of timber in the United States had been responsible for the phenomenal development of Canada's pulp and paper industry, where exports of newsprint had grown from twenty-five thousand tons in 1910 to seven hundred thousand tons in 1920.

The potentialities of forest wealth are becoming more and more apparent with the passing years. The preservation of the forests is a matter of national concern, and too much care cannot be exercised in protecting them from fires.

the National Wholesale Lumber Dealers' Association. The program is modest, if anything too conservative. For the amount that Congress is asked to appropriate for reforestation falls far below the country's needs. Thirty or forty years ago it would have been sufficient. Conditions are worse now, timber is scarce and costly, and not only would more radical measures be wise, but they are called for by the logic of the situation. Nevertheless since the program provides for the inauguration of national reforestation, Congress should not hesitate to adopt this plan or similar plans. Nor should it delay. Already years that would permit planted trees to grow to marketable

size have been wasted. A national program is not sufficient. All the timber States should engage extensively in acquiring large tracts of non-agricultural land, adding to them from year to year, and in reforesting them.

New York Commercial and Financial Chronicle: The gospel of forestry and reforestation is not a matter of times and seasons; it is for all times and all seasons. Let us all resolve here and now to strive more vigorously than ever to save the forests we love so well, the forests that have sheltered us from the heat in our vacations, and given us some of the greatest pleasures of our lives. A program with this end in view has been outlined in the form of demands for action by national and State legislatures.

Madison (Wis.) Democrat: The American Forestry Association has taken up betimes a renewed campaign for promotion of a policy for forest preservation with a view of congressional legislation. United States Forester William B. Greeley has expressed his approval of the plan, and practically all interests are united thereon, including the government authorities, publishers, lumber manufacturers, paper and pulp manufacturers, wood-using industries and forest conservation associations. The rapid approach of an impending wood and paper famine is commanding the most serious consideration.

Washington Herald: The Forest Industries Program Committee has reached a definite and very practical program of forest preservation. This committee represents a combination of all the various bodies interested in or based upon timber protection; the Forestry Association, lumber interests, paper users, paper manufacturers, and others.

Plattsburg Press: Everybody agrees that we are running short of wood, though but few appreciate the actual situation. What we need as much as anything else in this connection is a real National Forest Policy. Thank Heaven a bill will be introduced in the coming session of Congress providing for just this and may it find ready response among our lawmakers in Washington. It is everybody's business today to shout for forest protection. Indiana has an area of twenty-two million and a half acres and at one time the State was covered with one of the best hardwood forests in the world, says the American Forestry Association in pointing out the need of action for a national forestry policy.

NATIONAL HONOR ROLL, MEMORIAL TREES

Trees have been planted for the following and registered with the American Forestry Association, which desires to register each Memorial Tree planted in the United States. A certificate of registration will be sent to each person, corporation, club or community reporting the planting of a Memorial Tree to the Association.

QUARTZSITE, ARIZ.

By Mary I. Pease: Robert S. Skinner.

DECATUR GA.

By Agnes Lee Chapter, Daughters of the Confederacy: Lt. Harold Byrd, Boys who went from De Kalb County, Ga., Boys from other States in 82d Division at Camp Gordon, Ga.

FORT VALLEY, GA.

By History Club: Sgt. John Frederick Withoft.

QUITMAN, GA.

Hannah Clarke Chapter, D. A. R.: Arthur Griffin, Henry Sapp, Hiram Treadaway, Our Heroes.

MUNCIE, IND.

By Delaware Post No. 19, American Legion and Delaware County Chapter War Mothers: Harry Deems, Thomas DeWitt, Edward William Elliott, Herbert David Fortner, Joseph Riley Feely, Manson Harrington, Lester Beno Harmon, Ora D. Hazelbaker, Frank B. Hukill, Cleo Clifford Heuchan, Ralph Hiatt, Carl Conrad Herdering, Omar Albert Huntsinger, Kenneth Hawk, William Kent, Vernon Kidd, William Paul Lewis, Paul Thomas Leatherman, Marcus Ward Minor, Harry Mutch, Newton Moppin, John Patterson Newell, Leonard Nichles, Francis O'Connell, Charles N. Parker, Burl Pittenger, Horace Mann Pickerill, William O'Leary Quirk, Earl Retherford, George Franklin Reed, Charles S. Randall, John Erskine Reynolds, Paul Richardson, Howard Ira Smith, Earl C. Spencer, Guy Shelton, Alonzo Gerry, William M. Thomas, Austin Clyde Wilson, Anthony Albino, Fred Baker, John Bobo, Frederick C. Breen, Fred Bicknell, Homer Brock, Clarence Barddull, Clarence Clouse, Ernest Conner, Oren Clark, Noah R. Cord, Orville Cook, George Carmichael, Sharon Danford, Gray Davis, Frank Dillon, Clyde Wychoff, Frank E. Worrell, John H. Worrell, Glen Shipley, Lowell Mikody, William Taylor.

ANN ARBOR, MICH.

By Saline Woman's Club: Saline Boys Killed in War.

DETROIT, MICH.

By Conservation Committee of Twentieth Century Club: Major Hartwick, (5). Progressive Study Club: Dead Soldiers.

IONIA, MICH.

By Church and School of S. S. Peter and Paul: Charles E. Kelley, John Lesky, Isaac Boursou.

UTICA, MICH.

By Tuesday Club: Corp. Victor L. Rieck, William C. Landerscher, Jesse Moore, Jesse F. Parrott, Raymond Gaudy.

FREDERICK, MD.

Mrs. Victor L. Baughman: Capt. Charles D. Sigsbee, Commodore George Dewey, Lt.

R. P. Hobson, Rear-Admiral W. T. Sampson, Commodore Winfield Scott Schley.

HAMILTON, MASS.

By Mothers Club: Maj. Augustus P. Gardner, Lt. Samuel P. Mandell, Sgt. Maj. Wm. J. Collins, Corp. Wm. L. Taylor, Reginald Young, Lester D. Hodgson.

SHREWSBURY, MASS.

By Shrewsbury Women's Club: Theodore Roosevelt.

COOK, MINN.

By Daniel Gustafson Post No. 387: Charles Daniels, Alfred J. Gustafson, William H. Lahti, Clarence R. McDonald.

INTERNATIONAL FALLS, MINN.

By Junior High School: Class of 1920.

HUNTSVILLE, MO.

By Chautauqua Literary Scientific Circle: Our Returned Soldiers and Sailors, Huntsville Men Who Died in Service.

FERNLEY, NEV.

By Fernley Improvement Club: August Vienne, Frank Madelena.

BINGHAMPTON, N. Y.

By Civic Club: Gilbert M. Darling, Raymond Jobson, Everett Monroe Reside, Leo Dandlinger, Charles Finnan, Corp. Harold E. Robertson, Charles Edward Lasher.

FLUSHING, N. Y.

By Broadway Country Club: Capt. John M. Foote.

HEMPSTEAD, N. Y.

By Mrs. Helen E. Bloom: Ernest Stratton Bloom.

NEW YORK CITY

By American Legion: David W. Gentle, Metropolitan Post No. 385, American Legion; John R. Ahern, Lt. Thomas F. Collins. John Conefry, James J. Sheehan, Harold H. Gaskell, Daniel Hanley, Valentine N. Kessel, Alfred Lendrum, Sgt. Irving Olstrum, Walter C. Powell, William A. Riegel, Sgt.-Maj. Augustus Sharretts, Company D, 307th Infantry, 77th Division: Capt. Thomas W. Hastings, Lt. Wallace McL. Woody, Sgt. James H. Ames, Sgt. Archie J. Elliott, Sgt. John J. Rechlin, Corp. Sebastino Corenza, Corp. Frederick J. Dondero, Corp. Edward Goonan, Corp. William M. Muhling, Corp. Anders Rosenovold, Corp. Frederick Schwenke, Corp. Charles R. Seitzberg, Harry Abramowitz, Byron E. Belknap, Joseph Bertany, John Blundell, Ernest J. Campbell, William De Carnis, Edward M. Wynne, John W. Williams, Andrew Vento, Salvatore Di Miceli, Edward Duffy, Nile Eckhoff, Thomas J. Haley, H. L. Havens, William F. Hartnett, Walter Hayward, Thomas A. Jones, Hyman Klein, John W. Kohler, Harry Kupsick, John D. Mundie, John J. Murphy, Frank O'Laughlin, Arend Oelkers, Samuel Packer, George R. Pfahl, Harry Phanco, Julius Sand,

Jeremiah Saxe, Samuel Schambaum, Ralph Schurr, John H. Stender, Alfred Stengel, Isadore Swirsky, Thomas Tangney, Andrew J. Tedesco.

TONAWANDA, N. Y.

By Women's Relief Corps: Benjamin Hoffmeister, Walter S. Jones, Elmer Kaufman, John W. Kenbrick, Fred Liebes, George Martin, Edward J. Meyers, J. Donald Mundie, Dr. Martin F. Nolan, Peter Piotrouic, William Pohlman, George Rathgeber, James Rogers, John Roth, John Rubbert, Elmer Runge, Edward Anmerman, John Badrow, William Barrow, Leon J. Beaulac, Charles Bracker, Joseph Brozostowicz, Albert Burrow, Nick Evans, William P. Exner, Chester Fitzgerald, Harry Gombert, Otto Gottshalk, Arthur Hartman, Sanger Hathaway, Ernest Hauser, Louis Herman, Charles F. Scott, Walter Sharts, Sylvester E. Shaw, Frank Summer, Ferdinand Sterz, Edward D. Strough, Frank Wark, Norman A. Watershat, Ernest T. Wendt, Peter Balling, Herman John Boehneke, Herbert Bridger, Daniel P. Dahl, Frank Gillie, Leo A. Gurvin, Clarence Harder, Hiram J. Haskins, John Heider, Chester Hoffman, Daniel Horan, Robert L. Koch, John K. Kohler, Otto H. Liebeck, William H. McAlister, Russell J. Martin, John F. Ott, George Roeder.

YONKERS, N. Y.

By Yonkers Overseas Veterans, Crusaders' Post 353, Veterans of Foreign Wars and Valley Social Club: Harold John Wakefield, Michael J. Conners, John L. Allan, Sidney Comes, Frank V. Palmer, William Hermance Prime, Arthur A. Greene, Michael J. Jackson, Randolph Lamb, John J. Morris, Henry J. Brink, Stephen J. McCall, William J. Goff, William H. Whalen, Edward Lamont.

MORGANTOWN, N. C.

By Mrs. Arthur M. Ingold: Joyce Kilmer.

CANTON, OHIO

By Lincoln Highway Memorial Association of Stark County: Fallen Soldiers of Stark County, Corp. Floyd A. Hughes, Corp. Emmet H. Weller. By Mr. and Mrs. T. D. Vogelgesang: Karl W. Vogelgesang. By Friendship Club of Canton High School: Sgt. Wilford Quayle Holwick; By Madison-McKinley Chapter, National U. S. Daughters of 1812: Roscoe W. Hyatt. By Betsy Ross Tent, Daughters of Veterans: Civil War Veterans, 1860-1865. By Canton Auxiliary No. 5, United Spanish War Veterans: United Spanish War Veterans, 1898. By Lincoln Highway Memorial Association of Stark County: Corp. Erving Jones. By Invincible Review, Woman Benevolent Association of Macabees: August S. Schadler. By Mr. and Mrs. E. E. Miller: Sgt. Roscoe Conkling Miller. By Mrs. Jennie S. Reed: Karl Wilbur Reed. By Evangelical Sunday School: Corp. Charles A. Kell. By Madison-McKinley Chapter, National Society U. S. Daughters of 1812: Capt. Urban S. Wetzel.

ON ACCOUNT OF THE UNUSUAL DEMAND FOR THE EARLY ISSUES OF LAST YEAR'S MAGAZINE, YOUR ASSOCIATION WOULD APPRECIATE BACK COPIES OF 1920 NUMBERS FOR PURPOSES OF BINDING AND REFERENCE USE. PLEASE SEND THEM TO 1214 SIXTEENTH STREET, NORTHWEST, WASHINGTON, D. C.

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CANADIAN NOTES

AT the Imperial Forestry Conference, held during the past summer at London, England, stress was laid upon the urgent necessity for a comprehensive scheme of forest research, to serve as a basis for the intelligent handling of the forest with a view to its perpetuation by wise use. It is recognized by those familiar with conditions, that lack of intelligent direction in the method of forest exploitation results usually in the deterioration of the quality and quantity of the succeeding forest, if, indeed, the forest is not entirely destroyed and the land rendered wholly unproductive.

The effects of repeated forest fires in bringing about forest devastation are now quite generally recognized, and object lessons may be seen in all parts of the country. The serious effect upon the composition of the forest brought about by the lack of intelligent regulation of the methods of carrying on cutting operations, are, however, less recognized. For example, white pine, formerly the premier timber tree of Canada, has largely disappeared from great areas where it was formerly plentiful and where it formed the foundation for the early prosperity of the timber industry of Eastern Canada. The methods of cutting were such as to favor the increasing preponderance of the less valuable species.—(Conservation.)

NOT many years ago spruce was considered the only wood that could be used in the manufacture of newsprint, says R. D. Craig, in "Conservation." Gradually, and with much opposition, balsam was admitted in mixture with spruce, until now it is accepted in practically unlimited quantities.

We now find the despised jack pine suggested as a substitute for spruce, and the research departments of several of the progressive pulp and paper organizations of Canada have established the fact that it is quite feasible to use jack pine in either the sulphite or groundwood processes of pulp manufacture.

The fibres of jack pine are longer than the fibres of spruce, and the amount of fats, resins and waxes, hitherto assumed to be prejudicial, is not sufficient to preclude its use as sulphite pulp. It appears to require,

however, a stronger acid and a longer cooking than other species, and must, therefore, be manufactured separately. In the mechanical or groundwood process, it is claimed that it will make just as good, if not better, pulp than any on the market.

The use of jack pine for this purpose will materially prolong the productive life of the pulp and paper industry in Canada. Though there is as yet very little reliable information on which to base an estimate of the amount of jack pine in Eastern Canada, it is thought that it would probably furnish not less than 60,000,000 cords of pulpwood. In the Prairie Provinces, there is perhaps twice the amount, and, in British Columbia, there is over 20,000,000 cords of lodgepole pine, which is closely related to the jack pine of the east. In addition, there are large areas covered with young jack pine and lodgepole pine, which will reach merchantable size in a comparatively short time. Much of this wood, no doubt, will be used for ties and lumber, but there will still remain a very considerable amount for pulp. The utilization of the jack pine as pulpwood will facilitate the exploitation of the spruce and other species in places where there is not sufficient of the latter alone to warrant logging operations, and it should greatly reduce the waste at present incident to the production of hewn ties.

Jack pine possesses many qualities which recommend it as a continuous forest crop. It is extremely hardy and will grow on the poorest soils, if not too wet, and it is usually sound. It reproduces more prolifically than any other conifer in Eastern Canada, as is evidenced by the way it has replaced the original stands of white pine or spruce in many places, following cutting or fire. It grows rapidly and under natural conditions will attain pulpwood size in a shorter time than spruce or balsam.

Many other kinds of wood, including poplar, birch and hemlock, can be used in the pulp and paper industry, and it is hoped that further research will result in their more general utilization for this purpose.

THE Laurentide Pulp and Paper Company is cutting a thousand cords of hardwood to be used in the manufacture of ground woodpulp. The species being cut are poplar, white birch, yellow birch and

maple. The two first will be floated and the two latter will be transported to the mill on barges.

THE appreciation of the Quebec Government of the necessity for the practice of forestry on its non-agricultural lands, and of the need for thoroughly trained foresters to make its program effective, has recently been further evidenced. Four of the employees of the Provincial Forest Service—graduates of the Forest School at Laval University—have recently been sent to Europe by the Provincial Government, to spend a period of six months in making advanced studies of forestry practice and forest utilization in France, Belgium, Switzerland and Germany. One of the men will extend his studies to cover a period in Sweden. Among the lines of investigation to which particular attention will be paid by these men will be methods of lumbering, sawmilling, silvicultural practice, reforestation, aerial photography, forest research, wood technology, and wood utilization, including the development of markets for hardwood species through small wood using industries.

While forestry conditions in Europe are widely different from those in Canada, the general principles of the science of forestry are the same the world over, though it is of course necessary to adapt the practice to local conditions in every case. In Europe, the practice of intensive methods of forestry—the systematic growing of wood crops—has been a matter of development through centuries, and foresters from other countries can learn much of direct value to them in a study of methods and conditions there. A period of study in the forests of Continental Europe is, for example, a regular part of the curriculum of English and Scottish forest schools which prepare men for the practice of forestry in the United Kingdom.

THE planting of 5,000,000 trees a year is the plan of the Laurentide Paper and Pulp Company of Canada. The Canadians are facing a replanting problem on the lands of the company in Quebec, where pulpwood is being cut. Similar plans of reforestation by other paper manufacturers would do much to relieve the probable paper shortage of the future.

SERVICE TO MEMBERS

Members of the American Forestry Association are entitled to a ten per cent discount on the publishers' price of all books and magazines if order is placed direct with the American Forestry Association.

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FORESTERS ATTENTION

AMERICAN FORESTRY will gladly print free of charge in this column advertisements of foresters, lumbermen and woodsmen, discharged or about to be discharged from military service, who want positions, or of persons having employment to offer such foresters, lumbermen or woodsmen.

POSITIONS WANTED

WANTED—Position as City Forester. Technically trained and experienced forester. 30 years old. Have had 5 years experience in city forestry, tree surgery, landscape work. Box 2010, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (2-5-21)

GRADUATE of a recognized forestry school having had several years practical experience in all phases of forestry, both public and private, and experienced in portable logging operations, desires to make a change. Will consider any proposition in any part of United States or Canada. Box 2030, care American Forestry Magazine, Washington, D. C. (2-4-21)

TECHNICAL FORESTRY GRADUATE, B. S. 1908, M. S. 1914, desires position as City Forester. Twelve years practical experience in tree surgery, planting, transplanting, spraying, orchard care, improvement cuttings and landscaping, including making and execution of plans. Employed at present. References if desired. Married, age 41. Box 2020, care American Forestry, Washington, D. C. (2-4-21)

YOUNG MAN, 30 single, technical training and experienced in forestry and engineering, also first-class knowledge and experience in accounting and office work, desires position offering opportunity for the future. Address Box 2000, care AMERICAN FORESTRY. (2-4)

BUSINESS MAN with technical forestry training and experience, a specialist in aerial mapping and patrol, experienced in protection, cruising and administration, desires responsible position. Now engaged in economic study of paper industry. Address Box 980, care AMERICAN FORESTRY, Washington, D. C. (2-4)

YOUNG MAN WITH WOODS EXPERIENCE and college and military training, desires position in connection with management of forest lands on large estate. Address Box 990, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (2-4)

GRADUATE of the Ranger Course of the Lincoln Memorial University, Harrogate, Tennessee, wishes to secure work as a forest ranger or guard. Twenty-four years old. Address Box 965, care American Forestry, Washington, D. C. (11-1-21)

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WANTED—An assistant forester. Good place offered for a recent graduate who would like to get in business for himself in an excellent location. Address Box 920, AMERICAN FORESTRY MAGAZINE. (8-10-20)

WANTED: A married man with small family, with technical forestry training and practical experience, also having some knowledge and experience in farming and with farm machinery, to act as forester and superintendent of private forest estate of 500 acres in eastern Connecticut. House provided with modern conveniences. A good position for a good man. Address, Box 975, Care AMERICAN FORESTRY.

STATE NEWS

IDAHO

WHEN the Idaho State Legislature meets in January it will be approached with a bill to authorize a survey of the forest resources of the State to be made by the School of Forestry of the University of Idaho. This survey will be to determine the quantity and availability of existing stands containing raw material suitable for pulp mills, wood-working and by-products industries and the probable future supply of such material from young growth coming in on cut-over or burned-over areas. The object of making a survey of this character is to have definite statistics available to attract capital from other sections to this State by showing the possibilities of establishing pulp mills, wood-working and by-products industries here. The bill calls for an appropriation to cover the expenses of this survey and it is believed that the expenditure of this sum will be more than repaid in a very few years by the industrial development which it will attract to the State. It appears that not only eastern paper mills, but many other industries manufacturing wood products or by-products are canvassing the western situation to determine the possibility of re-establishing themselves in a new region because of the exhaustion of the nearby supplies of their raw material and the State which can furnish these industries with concrete information as to the opportunities for permanent establishment within its borders is the State which will attract this development.

The plan of distributing forest and shade trees at cost to the people of the State is growing in favor from year to year as is shown by the fact that the business has nearly trebled the past biennium. Approximately one hundred and seventy-five thousand trees were distributed in this period. There is an increasing demand for black locust for fence post production.

A meeting was held in Boise which was called together by the State Land Board for the purpose of being enlightened on forest problems, particularly fire patrol and protection. While no definite action resulted from the meeting the opinion was expressed by many present that strides had been made in bridging the gap between private and State interests in the forests of the State. The main issue, on which both sides agreed, was that forests which are under the supervision of the United States Forest Service should be patrolled with the fire protection feature most in mind. Cruising and classification of the forests should also be done.

ILLINOIS

REMARKABLE developments in forestry in Illinois are confidently looked for this season. The Constitutional Convention, sitting recently at Springfield, passed the following section: "That the General Assembly shall pass laws for the encouragement of forestry and may classify for taxation areas devoted to forests and forest culture." It is hoped that the delegates will stand solidly behind this action and that as a consequence legislation favorable to forestry will be introduced into the next constitution.

LOUISIANA

A PROJECT to encourage the boys of the State to reforest Louisiana, put idle lands to work, and incidentally teach the youth the importance of conservation and thrift, was the dominant note struck at the first meeting of the General Forestry Advisory Board, appointed recently by Governor Parker. The Forestry Board was created by Act of the last General Assembly, its principal function being to advise with the commissioner of conservation on all matters pertaining to forestry in the State and to approve expenditures of the Forestry Division of the State Department of Conservation.

Methods will be worked out to promote a statewide movement that it is thought may result in the reforestation of hundreds of thousands of acres, the actual work being performed by boys under the supervision of the Superintendent of Forestry, R. D. Forbes. Briefly the plan is to induce farmers, who may have strips of land not well adapted to agriculture, to give such land to their boys, and to enter into a contract with the State, the farmer as trustee for his son, to set aside such strips for a term of years exclusively for the growing of trees. As the boy grows to manhood the trees grow with him, and upon arriving at maturity the boy will find himself in possession of a well timbered tract of second growth, which will be an asset to his purse and an asset to the State itself.

The plan is similar to that which was inaugurated by Henry E. Hardtner, at Urania, several years ago, which has worked out so successfully that it has attracted international attention. In the latter case the boy will look out for reforestation, protecting his wood lot from fire and hogs, fencing it, etc. Upon reaching manhood's estate he will have a fine stand of timber ready for the ax and saw.

It was the opinion of the members of the board that the movement, if encouraged, would prove as far-reaching and beneficial as the Boy Scout plan. Thousands of

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Clarence M. Weed, D.Sc.

This is a new and revised edition of Emerson and Weed's standard work. A full-page plate is devoted to each tree, showing its form as a whole, and its foliage, bloom, and fruit in detail. The new introductory material tells the characteristics of the different trees and how they change in Summer, Autumn, Winter, and Spring, why they drop their leaves, how they prepare the flower and leaf buds for new growth. It explains how to distinguish each species readily, and describes the rarer trees imported for landscape gardening. Directions are given for aiding trees to thrive and look their best. 19 illustrations. Flat 8vo. 293 pages. Ornamental cloth.....\$3.50 Net

farmers have strips now lying fallow that could be utilized in growing a crop of Southern pine. If generally adopted it would have wide influence on the future of the lumber industry in Louisiana.

By lowering taxation on such lands to an irreducible minimum the State will encourage the plan and the Forestry Department will teach the boys how the work is to be done.

The first official act of the new board, which met in the offices of Commissioner M. L. Alexander, was to approve the expenditure of one-half the annual appropriation for forestry purposes for forest patrol and fire protection. This will approximate \$30,000, the estimated income of that division of conservation annually being \$60,000.

NEW YORK

WHITEFACE Mountain, one of the most imposing and famous peaks of the Adirondack region, is to be added to the State Forest Preserve. This announcement was made by Conservation Commissioner George D. Pratt at a meeting of the Commission recently.

The purchase contains nearly 4,500 acres of land, much of which is covered with the original stand of virgin spruce forests. Two years ago extensive lumbering operations were commenced on the northern side of the mountain with the resultant "slash," which constituted a serious fire hazard. Acquisition of this property by the State will prevent further lumbering and insure the preservation of the Whiteface forests. Not only will the scenic beauty of this conspicuous peak, which dominates the Lake Placid region, remain unmarred as the result of its purchase by the State, but the whole area will be thrown open to the people for public recreation purposes as in the case of other parts of the Forest Preserve.

OREGON

OREGON has the largest amount of standing timber of any State in the Union. Over one-fifth of the nation's supply is within the boundaries of the State. To safeguard this great asset, laws have been enacted by the legislature which are recognized as progressive and which place Oregon among the few States having a well thought out forest code.

For nearly 10 years the State Board of Forestry, which through its personnel, represents alike the public producer and consumer, has confined its activities very largely to fire prevention. This will continue to be its principal task. The Board, however, believes the time has arrived to outline a definite policy looking to the future well-being of the State and aimed at keeping productive and bringing to a state of productiveness vast areas best fitted for the growing of successive forest crops. In doing this the Board recognizes that it should be concerned not alone with those

things which the State may do independently, but also with those which should be done by the Federal Government independently and in co-operation with the State and private owners. Responsibility of private owners in this whole program is not overlooked nor is the need for public action to make possible practice of forestry by such private owners.

Ordinarily we think the vast area of Government owned timber land held and managed as National Forests is sufficient safeguard for our future supplies. As a matter of fact but one-fifth of the present available standing timber of this nation is in Government ownership, the other four-fifths being privately owned. Economists, foresters and lumbermen have realized for a long time that as a nation we are drifting toward a future shortage of raw material to keep alive the lumber industry and many others dependent upon it. The situation is not alarming. A shortage will not be apparent for many years, but it should be realized that we are dealing with a crop which requires from 75 to 150 years to mature.

PENNSYLVANIA

REPLACING chestnut trees ruined by the blight with commercial, quick growing young trees is attracting nationwide attention in the experiments being carried on at the Sheerlund forest plantation near Reading, Pennsylvania. The Japanese larch, it is thought, will be a good substitute for the chestnut.

There are now about 2,000,000 pines and spruces on the plantation, and 500,000 more young trees in the nursery. Scotch and Austrian pines also have been included in the experiment, but have not done as well as the red, southern and white pines, although the white pine also is attacked by insects and fungi. The pines take from 45 to 50 years to mature. The spruce and Japanese larch will reach commercial size in 35 years and are virtually immune from pests.

The replacement seems to be working successfully and if it proves so, the plan no doubt will be followed all over the country.

NEW ALASKA FOREST DISTRICT

IN order to get the administration nearer to the ground, Secretary Meredith, of the Department of Agriculture, has just approved the establishment on January 1 of a new National Forest District for Alaska. This will be known as the Alaska District, with headquarters at Juneau, and will be in charge of Charles H. Flory, as District Forester. Mr. Flory has been Superintendent of Alaska National Forests for the past two years, with headquarters at Ketchikan. The new District headquarters will remain at Ketchikan until July 1.



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THE TIMBER SUPPLY AND WHAT TO DO ABOUT IT

(Continued from page 70)

a region where public opinion is not yet wholly convinced that adequate measures should be taken to prevent and suppress fires.

Recognition of the facts of timber depletion and idle lands suited to the production of timber, is hastened by the pinch of actual timber shortage which is handicapping the industrial life of the region. Woodpulp is soaring in price, and it can not always be had. The oak for Grand Rapids furniture is being cut in Louisiana and Tennessee. The hickory for the wheels of Michigan automobiles is shipped from Arkansas and Mississippi. Michigan does not even supply itself with enough telephone poles and railroad ties, but pays freight on poles from Idaho and ties from Virginia.

This has happened in the State of Michigan, which for over twenty years produced more lumber than any other state and which, as late as 1899, held second place in total cut of lumber.

If, as in Ohio, the removal of forests had been regularly followed by agriculture, there would be little cause for regret. But this has not been true of Michigan. Out of the 36 million land acres of the state, 18 million are reported as included in farms with less than one-half of this area cultivated. Of the remaining 18 million acres not included in farms, at least 10 million

are believed to be permanently unsuited for agriculture and chiefly valuable for timber production. The state pays a freight bill of around \$2,000,000 annually for imported lumber which, with the exception of certain special classes of material, might be grown on this 10 million acres of waste which is reverting to the state for non-payment of taxes at the rate of 3,000 acres a month.

But Michigan, while a classic example of the bad effects from misuse of forest land, is not alone in her neglect to keep her acres productive. Aside from the greater prevalence in Michigan of a certain type of sandy soil which is particularly subject to damage by repeated fires, the story of timber depletion and non-productive land in Michigan has been or is being repeated in numerous other states. The State of Massachusetts, for example, contains denuded forest lands within a stone's throw of her dense population and highly developed industries which have been estimated at a total of one million acres, and which are largely idle so far as growing wood of economic value is concerned. In its report on a Senate resolution introduced by Senator Arthur Capper, the National Forest Service states:

"Three-fifths of our primeval forests are gone; the timber remaining is being consumed four times faster than it is being replaced. With the successive exhaustion of our principal forest regions in the northeastern states, the Alleghenies, the Lake States and the Atlantic seaboard, and the imminent exhaustion of the Gulf States pineries, the cost of transporting forest products to the average consumer is steadily rising.

"The effects of forest depletion include all the elements of higher freight costs, more restrictive competition, dependence upon the efficiency of transportation, dependence upon climatic or labor conditions in restricted regions, and innumerable difficulties in getting needed materials of the right kind and at the right time. If all the timber in the United States were cut and our needs supplied by imports from South America and Siberia, the situation would differ from that which we are now rapidly approaching only in degree. The effect of original timber exhaustion may be compared with what would happen if the orchards and truck farms in the eastern and central states disappeared and the housewife had to obtain the daily necessities for her table from Florida and California.

"The kernel of the problem lies in the enormous areas of forest land which are not producing the timber crops that they should. There are 326 million acres of cut-over timber lands in the United States. Their condition ranges from complete devastation through various stages of partial restocking, or restocking with trees of inferior quality to limited areas which are producing timber at or near their full

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A group of Evergreens to shut out the busy street, or form a background for the flower garden and separate it from the service court, is one of the things Hicks Nurseries can supply you to perfection. Here are thousands of evergreens, root-pruned, transplanted wide apart and pruned to uniform shape and dug with big solid balls of earth held by plat-forms and canvas.

New and rare trees, shrubs and flowers from the Arnold Arboretum, Highland Park, Rochester and elsewhere will delight garden lovers.

Cover plants to creep over the ground and give pleasure with berries and evergreen foliage are a new feature of the Hicks Nurseries. Azaleas, red flowering Dogwood, Canadian Yew, Silver Bell and many other plants are suitable for decorating the woodland.

Pruned lindens and hornbeams for pleached alleys are just the thing for entrance court or terrace. For seashore or dry, acid hills, Hicks Nurseries have large trees and also small trees at low rates. You are entitled to the best and the newest plants approved by garden experts and landscape architects. You will find such plants at Hicks Nurseries.

Box F

Westbury, L. I., New York

capacity. On 81 million acres there is practically no forest growth."

This is the larger picture of depletion, non-production, and dislocation of industries, of which the story of timber in Michigan is merely a fairly typical part.

When these facts make themselves at home in the consciousness of Mr. Average Citizen, he will be convinced at last that timber depletion and attendant evils are realities—not creations of the imaginations of foresters. If there remains any lingering doubt in his mind it will be dispelled when he proceeds to build that home he has been planning for and saving for through so many years. He will find that if both the average value of all commodities and the average price of softwood lumber in the year 1860 are taken as the index figure 100, then the present average value of all commodities would be represented in the year 1920 by the index figures 294; but the average price of softwood lumber in 1920 is represented by the index figure 540. The increase of softwood values since 1915 has been over twice as great as the average increase of all commodity prices. This proportion of increase in the price of lumber is not entirely due to timber depletion, but when Mr. Average Citizen finds that the sum he has painfully accumulated for his new home is not sufficient to build the house in 1920, he and Mrs. Average Citizen will do some pointed thinking as they again postpone the construction of the house they had set their hearts upon. They will no longer harbor any doubt that timber depletion means something to them personally—means a blow at their personal happiness and comfort.

Again, we have before us the tragedy that the aroused public opinion which Mr. Average Citizen generates will be too late—too late, that is, to save that 81 million acres on which there is practically no tree growth. A region larger than the great States of Iowa and Missouri has been cut-over and is now idle because public opinion remained passive too long. By demanding a slightly different treatment of this land, public opinion could have kept the 81 million acres continuously productive. To bring it back to productiveness will be a far more difficult and more expensive matter.

But it is not too late to stop the remainder of our 326 million acres of cut-over land from reverting to a condition of idleness. The area of idle or largely idle land is being increased by from 3 to 4 million acres annually as the cutting and burning of forests continue. The area of forest land not required for any other economic use is estimated at 463 million acres, and this would provide an ample supply of wood for all our needs if kept productive. Depletion of our timber supply has resulted not from using our timber resources but from failure to use our timber growing land, and by far the greater

part of our forest land may still be kept continuously producing timber if Mr. Average Citizen definitely decides that we have left the period of plenty of timber and crossed over into the period of insufficient timber.

ECONOMY IN LUMBER PRODUCTION

THE Committee on Conservation and Standardization recently appointed by the newly organized Association of Wood Using Industries has already begun to function, as might have been expected from the fact that W. A. Babbitt, Secretary of the National Association of Wood Turner's, is its chairman. It is difficult to estimate the importance of this work, not only to a great variety of manufacturers, but to the country as a whole, because of the economies which it will make possible in wood utilization. Under a practice which grew up when stumpage prices were insignificant, says Austin F. Hawes, Field Secretary and Forester of the National Association of Wood Turners, we are still wasting the greater portion of every tree which grows in the forest. By a proper co-ordination of the needs of the different industries it will be possible to saw the tree when it is felled into more economical lengths; and to saw each log into the dimensions for which it is best adapted.

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NATIONAL FORESTS IN THE EAST

THE National Forest Reservation Commission, which authorizes the purchase of lands for Eastern National Forests, at a recent meeting recommended to Congress a continuation of Government purchases of forest land and the appropriation of adequate funds to carry on the work. A large number of business and civic organizations have already gone on record in favor of enlarging the National Forest lands in the East. The great importance of the work has been made evident through the report on the Capper resolution submitted to Congress last spring, which showed 81,000,000 acres of denuded and unproductive timber lands in the United States, while the cut-over area is increasing at the rate of 4,000,000 acres a year.

The commission authorized the extension of the purchase work to Pennsylvania and New York, and the location of a purchase unit on the headwaters of the Allegheny River, with a view to lessening the danger from river floods at Pittsburgh and at other places located below Pittsburgh on the Ohio River.

The commission has authorized the purchase of 11,098 acres of land in the White Mountains and the Southern Appalachians at an average price of \$5.04 per acre. The lands approved for purchase lie in New Hampshire, Virginia, North Carolina, Alabama and Arkansas. Purchase of 7,000,000 feet of spruce timber at \$3 per thousand feet was also authorized by the commission. This timber is in the White Mountain National Forest, New Hampshire, but was reserved from sale at the time the land was purchased. This acquisition will enable the Government to control cutting operations upon approximately 1,500 acres of land, thus securing proper forest management and consideration of public interests.

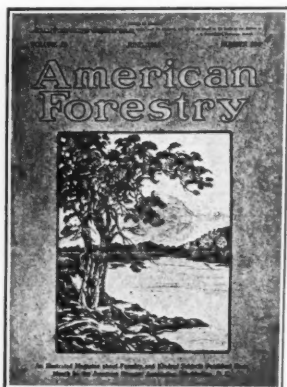
NEW ENGLAND TO HELP IN FIGHT FOR NATIONAL PARKS

THROUGH the formation of the New England Conference for Protection of National Parks fresh impetus has been given the fight against the invasion of the National Parks by commerce and their exploitation by private interests. In summing up the question, the New England Conference says: "The purpose of the National Parks is to preserve forever, in their primitive condition, certain few, widely separated examples of the American wilderness; of the original works and processes of nature; of our native wild animals and birds and plants, living natural lives in the homes of their ancestors. They are

BECOME A MEMBER

Any person may become a member of the American Forestry Association upon application and payment of dues.

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havens into which our people can hope now and then to escape. * * * The theory on which National Parks in this real sense must be based is that the people of the United States, who have set them apart, can afford to keep and want to keep this minute fraction of their total land area positively and definitely as the one and only reserve where these non-economic purposes may be attained in perfection and without compromise.

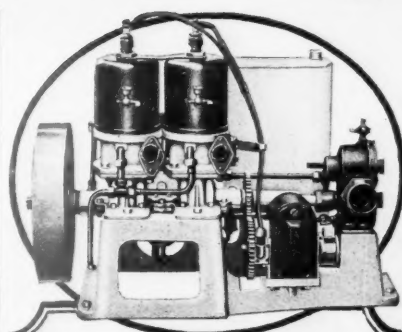
"Unless we follow consistently this policy of 'Hands off the National Parks,' with a clear perception of the principle behind it; unless we exclude from the parks every commercial development which by any possibility can impair their quality as exhibits of Native America and as places for the unadulterated enjoyment of natural scenery, we cannot avoid the gradual and progressive diversion of the National Parks from their proper purpose to those economic purposes which elsewhere rule unchallenged in the use of land by man."

PULP RESOURCES IN INDIA

EXCEPT in the annual waste growths of tropical and sub-tropical forests, the cellulose Expert to the Government of India as quoted in the *World's Paper Trade Review*, states he has concluded that no permanent settlement of the papermakers's oft-recurring difficulties of supplies can be

found. He has come to this conclusion after 24 years' work on this problem in various parts of the world. For many years this expert has been doing exploration and experimental work in bamboo pulp; for the last ten years in the service of the Government of India. After an exhaustive exploration of the coastal belt of Burma, he asserts that there is sufficient bamboo in sight, with the Savannah grasses of Assam, to produce 14,000,000 tons of dry pulp yearly. Bamboo being a grass, its pulp has many qualities in common with esparto and it can be used for all grades of paper. For newsprint while it does not exactly take the place of strong sulphite, bamboo can be advantageously used to the extent of half the present percentage of sulphite and if mechanical pulp continues to maintain anything like its present value it can be so cheaply produced that it can take the place entirely of mechanical pulp. The total cost of production will not exceed one-half of the present cost of wood pulp.

A plant is being established by the Forest Research Institute of India for further experimental work in investigating new sources of paper making material and for assisting the development of bamboo pulp enterprises. The Indian Government is favoring schemes which are being developed for the production yearly of about 70,000 tons of bamboo pulp.



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Stumpage Prices—Lowest rates considered, \$1.00 per M for green white pine and green spruce, \$.50 per M for green timber of other species and dead timber of all species.

Deposit—Two Thousand Dollars must be deposited with each bid to be applied on the purchase price, refunded or retained in part as liquidated damages according to conditions of sale.

Final Date for Bids—Sealed bids will be received by the District Forester, Missoula, Montana, up to and including March 15, 1921.

The right to reject any and all bids is reserved.

Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the District Forester, Missoula, Montana, or the Forest Supervisor, Kalispel, Montana.

NATIONAL PARKS AND NATIONAL FORESTS

A CLEAR distinction of fields exists between National Forests and National Parks, says Secretary of Agriculture Meredith, in discussing the value of the National Forests as recreation grounds in his annual report to the President. "Areas of scenic grandeur or natural wonders which are exceptional in character should be incorporated in National Parks." But the National Forests "must be administered with definite provision for recreational use along with the development and use of their material resources."

The National Parks must be protected against any form of commercialization, declares Mr. Meredith. Unless they are limited to areas in which the beauties and wonders of nature are in reality so dominating that they justify prohibition of conflicting forms of use, it will not be possible to deny demands which will be made for the use of water power for irrigation and even for timber and forage. "Nor should we build up under the name of National Parks public properties which are open to various forms of commercial exploitation and which are in fact merely National Forests under a different designation," the Secretary says. "Above all, the national conception of our great parks as areas so fine and wonderful that they belong to the whole country should not be cheapened by making them simply a means for local development or advertisement."

"Areas whose dominant public values are economic do not belong in the parks," the Secretary asserts. "They should remain or be placed in the National Forests if they serve the primary function of the forests—the production of timber or the protection of watersheds. On the other hand, the economic service rendered by the forests should be no bar to the administration of small areas at many points within them for public recreational purposes or for the protection of their natural beauty." In fact, Mr. Meredith says, for every one of the National Parks there are literally hundreds of areas in the National Forests whose highest public use requires development of their recreational value, though it would not justify their administration as National Parks.

THE ANNUAL MEETING

THE adjourned annual meeting of the American Forestry Association will be held at the Willard Hotel, Washington, D. C., at 2 P. M., Friday, February 25, 1921. Members will vote upon proposed amendments to the by-laws providing:

For increasing the subscribing membership dues from \$3.00 to \$4.00 a year.

For a Board of Directors consisting of fifteen members, seven of whom—W. R. Brown, H. H. Chapman, Dr. Henry S. Drinker, C. W. Lyman, Charles Lathrop Pack, C. F. Quincy and E. A. Sterling—shall be permanent members, and eight

others, four being elected annually to serve terms of two years.

For the nomination by the Board of Directors of elective candidates for the Board.

For the election of the elective directors by vote of members present at the annual meeting and by the mail vote of those not present.

For the election of the president, vice-presidents, treasurer and secretary by the Board of Directors.

For the amendment of the by-laws, except as to the selection of directors, either by the Board of Directors or by the members.

For annulment of membership of members in arrears in dues for one year.

By order of the Board of Directors,
P. S. RIDSDALE,
Secretary.

BULLETIN ON BIRD LIFE

THE National Park Service of the Department of the Interior announces the publication of "Birds of the Papago Saguaro National Monument and the Neighboring Region, Arizona." The pamphlet is by H. S. Swarth, Curator of Birds in the Museum of Vertebrate Zoology in the University of California and a leading authority on the birds of Arizona. It contains a very interesting account of the bird life on the Papago Saguaro National Monument, near Phoenix and Tempe, Arizona, and on the Sierra Ancha, north of the Roosevelt Reservoir. Travelers over the Apache Trail should provide themselves with a copy, as an understanding of the bird life of the region will add much to the pleasure of their trip.

FARM WOODLANDS IN THE UNITED STATES

ABOUT one-third of all the forest land of the United States is on farms, says W. R. Mattoon, in a recent bulletin on "Forestry and Farm Income," issued by the Department of Agriculture. According to the latest census, the farm woodlands amounted to about 190,000,000 acres. In the eastern United States—east of the Plains—the total woodlands on farms amounted to about 178,000,000 acres. This is equivalent roughly to the aggregate area of the states of Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky and Tennessee.

Farm woodlands in the eastern United States form an area nearly eight times as large as the entire forest lands of France, which furnished practically all the timber required during the war by the armies of France, Great Britain, Belgium and the United States.

The present yearly income from farm woodlands in the South is estimated at about \$150,000,000. From the 53,000,000 acres of farm woodlands in the North, Mr. Mattoon estimates that the income to farms from timber products is \$162,000,000 annually.

INDIA TO EXPLOIT HER FORESTS

INDIA, with an almost untouched timber reserve, is preparing to exploit her forests. For the purpose of studying the most modern methods of logging, Mr. Charles Gilbert Rogers, Director of Forests of India for the British Government, is in the United States with a corps of seventeen engineers. These engineers are at present at work in logging camps in the Appalachian Mountains, and will gradually work toward the Northwest, then down the Pacific Coast, and will conclude their studies in the Southern Pine territory in February, 1921. They will take in every section of the country wherein a distinct method of handling logs is in operation, and will spend a month with each type of work.

Mr. Rogers called on Mr. J. E. Rhodes, Secretary-Manager of the Southern Pine Association, at New Orleans, to consult with him as to the program to be pursued to obtain the best results and while in the Association offices told something of the resources and plans of the British Government in approaching their problem of lumber production.

India is a little less than half the size of the United States, and possesses untold timber wealth. In only one section have there been in operation any mills sawing lumber, that being the Province of Burma, while in every other portion of the vast country all lumber is whipsawed by hand

out of the tree in the place the tree is dropped.

The topography of India is rough, with every problem in logging that is met with in the United States to confront them with the exception of the snow hauling of the North. In place of the snow there is always the heat to contend with, in some places a dry heat, in others a moist heat. At the coast line there will in some places be necessary the "pull-boats" and other logging apparatus and methods of the cypress swamps of the United States, while in the interior the problem will be to get the logs down the sides of the mountains.

Teak is now the wood mostly used in producing lumber, because teak is the only wood that will resist the attacks of the white ants of India. Teak grows along the coast lines, and there is today in the Province of Burma alone, where, as stated, the only milling has been done, nearly thirty million acres of untouched timber lands.

The timber of India will be operated upon a gigantic system of conservation. None but the large timber will be cut at any time, and the methods of logging will be selected that will insure the least damage to the smaller trees. This is possible in that country, as it has never been possible in America, owing to the title to the timber being vested in the State and the operations can therefore be conducted by the State on one national system, which will insure a perpetual

source of revenue from the forest wealth.

The men who are studying the American logging methods are all veterans of the World War, and are civil and mechanical engineers. When their studies have been completed here they will return to India to work under two American logging experts who are now there studying the conditions necessary for proper logging methods. Two experts from the United States Forest Products Laboratory at Madison, Wisconsin, are en route to India to advise as to kiln drying methods.

BOXING AND CRATING

WITH an enrollment of eleven officials of box factories and box-using concerns, the fourth commercial course in boxing and crating at the Forest Products Laboratory ended recently. The object of the course was to demonstrate for manufacturers and shippers the principles that underlie proper box and crate construction and the development of economical containers that will deliver their contents to their destination in a satisfactory condition at a minimum cost.

RECOVERIES by the Government, during the last fiscal year, for trespasses on the National Forests amounted to \$87,182 in damages and \$3,225 in fines. These included grazing, timber, fire, game, and occupancy.

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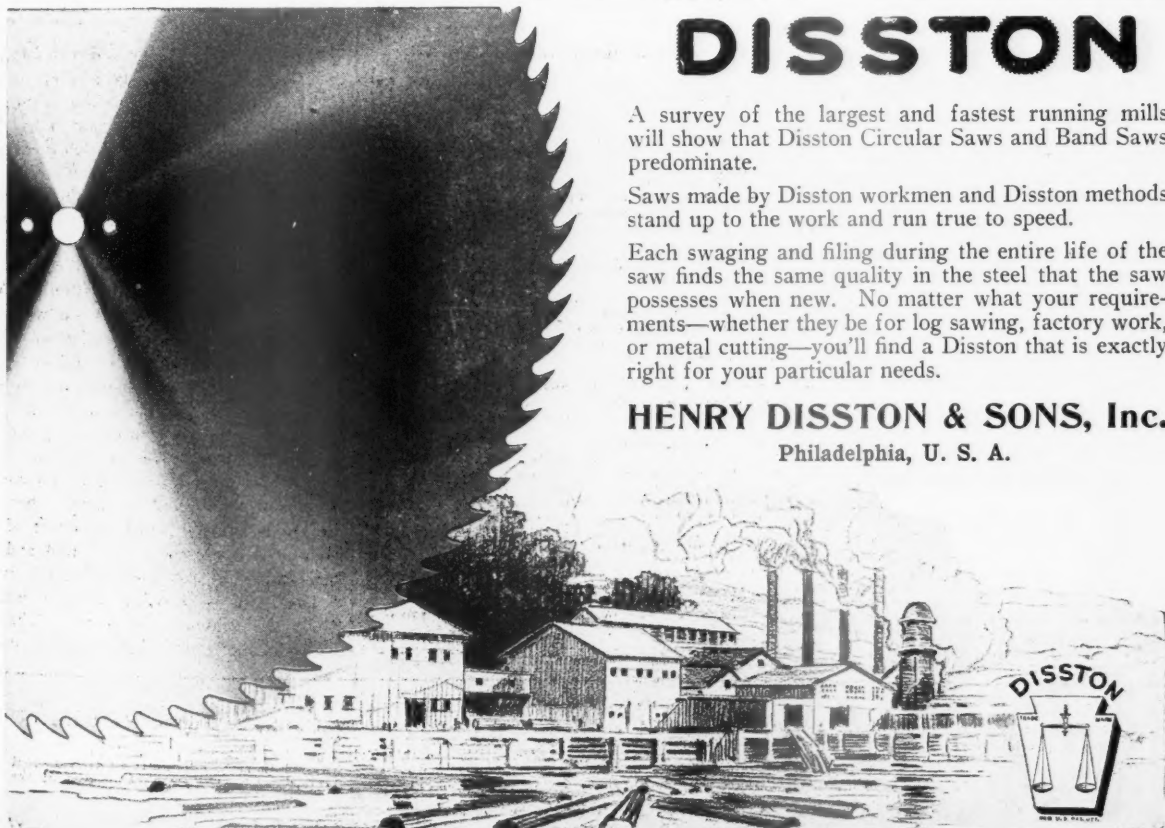
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BOOK REVIEWS

"Heart of Hemlock," Clay Perry, (Bobbs-Merrill), 1920, pp. 288.

Stewart Edward White wrote stories of the Michigan lumber woods of which "The Blazed Trail" was particularly memorable. Clay Perry is less ambitious and contents himself with a readable novel centering about the activities of a pulp and paper mill in Wisconsin. With respect to the pulp and paper industry, the novel is not particularly informative. In fact, it is to be doubted whether the author has more than a casual acquaintance with a paper mill and with the woods operations incidental thereto. But he has absorbed in some measure the spirit of the industry and reflects its growing worry about future supplies of wood. Thus: "On every sheet of paper that leaves the mill there is superimposed on the invisible watermark of the flowing stream and the falling tree, the magic word 'enlightenment.' I had rather be making paper than making laws."

And again, this bit of conversation between Holt, the hero, and his employer, President Thorpe of the paper company: "Diminishing raw material. That means but one thing to me—reforestation. Why, you've been slaughtering the goose that lays your golden egg!" "I know it!" cried Thorpe. "But that involves the man problem, again. It will take time and—"

"Yes, time and money and men and patience," cut in Holt quickly, leaning forward in his chair. "You've got the money, Mr. Thorpe. You've got to take time, have patience, find the men. I know where I can get men—a dozen foresters just out of khaki, looking for the main chance. I don't mean timber cruisers, tree killers; I mean real foresters."

The story itself concerns the doings of one Gary Holt who returns from the Army to his home in the mill town where his father rose from the ranks of river drivers. He is in love with Helen Edwards, just graduated from college, but already chief chemist of the paper company (1). Discontented with his routine job in the mill, Holt goes up the river on the drive where he encounters and overcomes the enmity of John Rod, the boss of the drive. There also he "finds himself," and by a test of personal courage, downs John Rod and gets his job,—and, of course, Helen Edwards.

The book is readable albeit almost too obviously dramatic in places. The dialogue is lively and the interest sustained.

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descriptive writing, but he is apparently more concerned with direct narrative. The author has missed opportunities for finally, the question remains—why the frontispiece, which is not related to the story, and why the title "Heart of Hemlock," when hemlock is notoriously apt to be shaky and unsound at the heart.—A. B. R.

Text-Book of Physics. By Louis Bevier Spinney. (Macmillan.)

This is a valuable test book for university and college students. The author has emphasized the practical aspects of the science, illustrating the laws of physics as far as possible by reference to familiar phenomena and exemplifying principles by discussing their applications. The subject of mechanics is stressed. The book will be very valuable as a basis for class-room work, to be supplemented by a course of experimentally illustrated lectures and suitable laboratory exercises.

Broken Shackles. By John Gordon. (Dorance.)

This novel, by John Gordon, will be widely read. An unusual, vital story that is true, it grips and bears one on from the silent strength of forest places to black, belching factory stacks, from the peace of an old and maple-shaded town to the world outside, with its snarled-up web of fashions, politics and driving, smashing industry. It is a story of many men and a few women—all real. A worker rises from the rest, and a woman—the one woman, comes to meet him. It is a story of today, filled with the breath of the woods, the smoke of the mills; work, and the wages of work are told. The plot is carved from life, and there is fascination in the telling.

Two very interesting leaflets have recently been issued by the Barrett Company, one treating specifically of the preservation of wood roof decks with carbosota and the other covering quite generally the subject of longer life for mine timbers through proper preservative treatment. They tell just what to do and how to do it, and are full of valuable information.

Recognition is being generally given to the place of forest fire propaganda in the national campaign being conducted for fire prevention, as evidenced by the last chapter in the reprint of "The Teaching of Fire Prevention" put out by the State of New Jersey, which is entitled "Forest Fires" and was written by C. P. Wilber, State Firewarden of New Jersey. The subject is thoroughly, clearly and convincingly covered.

Inspired by the message in the lines of "Forest Fires," by John D. Guthrie, S. Walter Krebs, the prominent young American pianist and composer, has set the poem to music and dedicated the song to the American Forestry Association. He first wrote it as a solo, but later arranged it as a quartette for male voices.

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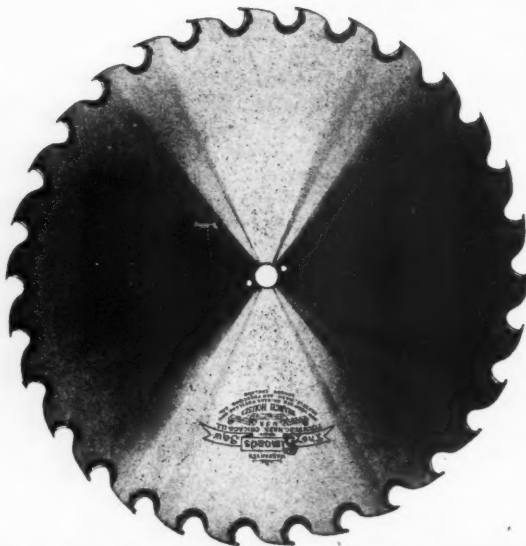


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THE ASSOCIATION OF WOOD-USING INDUSTRIES

A BIG step forward in forest conservation was taken in the organization and formal launching of an association of the various wood-using industries of America. The importance and size of these combined industries assures the power of accomplishment of the organization in the field of forestry, as it is their declared intention to urge a permanent policy of reforestation before the National Congress, to work out practical plans for conserving the present limited sources of wood supply, and to establish standardization of sizes used in the various industries in order to aid the lumber industry to secure a greater number of feet out of the logs, etc. This official federation of the wood-using industries also offers a splendid opportunity for the collection and dissemination of much needed information. The proper use of wood is one of the most vital questions of the day and the new organization, in its one capacity of acting as a general clearing-house in this field alone will perform a very valuable service.

The industries taking part in the organization were the Hickory Products Association, Automotive Wood Wheel Manufacturers' Association, Hickory Handle Manufacturers' Association, Associated Wooden Ware Manufacturers, The Four Ones, National Association of Egg Case and Egg Case Filler Manufacturers, National Association of Box Manufacturers, National Basket and Fruit Package Association, Central Bureau of Dining Table Manufacturers, Ply Wood Manufacturers' Association, National Implement and Vehicle Association, National Council of Furniture Associations, National Association of Chair Manufacturers, National Association of Wood Turners, American Paper and Pulp Association, Pulp Manufacturers' Association, Tissue Paper Manufacturers' Association, Writing Paper Manufacturers' Association, Cover Paper Manufacturers' Association, and the American Railway Engineering Association.

The officers are: President, Mr. E. E. Parsonage, representing the implement and vehicle interests; vice-president, Hugh P. Baker, representing the paper and pulp interests; secretary, William B. Baker, representing the furniture industry; treasurer and directors, F. A. Vogel, representing miscellaneous wood-using industries; W. A. Babbitt, wood turners; John Foley, wood preservatives, and W. Harry Davis, representing the wooden containers interests.

FIRE AND RAZOR-BACK HOGS PLAY HAVOC WITH YOUNG LONG-LEAF PINE

HOW the struggle for existence of young long-leaf pine on cut-over lands in the South is handicapped by hog grazing and recurrent fires has been brought out by a six-year experiment in Louisiana.

Millions of long-leaf seedlings sprang up over the South in the fall of 1913, resulting from a very heavy seed crop and favorable weather conditions. At the request of Henry E. Hardtner, of Urania, Louisiana, the Forest Service of the United States Department of Agriculture, in co-operation with the Louisiana Department of Conservation, laid out a series of permanent experimental plots. They were established at Urania in January, 1914, the aim being to secure reliable information regarding natural reproduction of long-leaf pine.

Four sample tracts of one-quarter of an acre each were selected of about the same character and about equally well-stocked with one-year-old long-leaf pine seedlings. Two of these plots were fenced against cattle and hogs and two left unprotected. Further, one plot in each of these two series has since been burned over yearly (or nearly every year), and the other two protected against fires.

A remeasurement of the sample areas was made in the winter of 1919-1920. The unfenced tracts were each found to contain only two long-leaf pine saplings. Since they originally had 734 and 813 seedlings, respectively, this was a loss of 99.6 and 99.7 per cent of the trees. The fenced tracts, on the other hand, were found to contain full stands numbering 1,513 and 1,707, respectively, of little long-leaf trees. This is the equivalent of 6,052 and 6,826 trees per acre under protection as compared with 8 per acre unprotected against hogs. This difference is practically accounted for, it is definitely known, by the fondness of the "razor-back" hogs for the thick succulent bark on long-leaf pine tap-roots. Although present in widely varying numbers, this famous southern forager usually occurs in sufficient numbers to destroy during the course of the first two or three seasons, and even during periods of extraordinary reproduction, the majority of all young long-leaf pines. It should be remarked that, so far as known, no damage of this sort has been reported from blooded hogs.

The effect of yearly controlled burnings is shown in a decided check in the growth of long-leaf and the killing out of practically all of the short-leaf and loblolly pines, which are not particularly resistant

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HEART OF HEMLOCK

This story, dramatized from Clay Perry's work is a splendid illustration of the brilliance of the author and is considered his masterpiece.

The story itself concerns the doings of one Gary Holt, who returns from the Army to his home in the mill town where his father rose from the ranks of river drivers. A pretty girl, an enemy, and "finding himself" makes an interesting tale.

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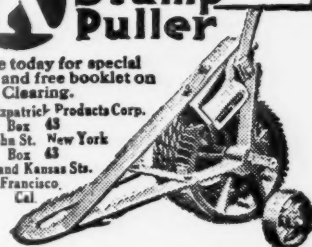
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to fires.

On the tract burned over yearly, only three-tenths of one per cent of the long-leaf saplings were over 2 feet in height and the tallest was 2.8 feet, while on the protected tract 16.3 per cent were over 2 feet and the tallest measured 7 feet. The effect of burning on a very small tract of this size, whether controlled or not, is probably considerably less severe and injurious than that resulting from a fire over a large area where there occurs a preliminary period of heating and drying by the wave of hot air preceding the arrival of the blazing fire front.

NATIONAL FOREST GRAZING FEES

GRAZING at the present is the principal source of money return to the Government from the National Forests, states Secretary of Agriculture E. T. Meredith in his annual report to the President. Since 1915, adds the Secretary, the grazing fees have been doubled, with the view of making them commensurate with current rental rates for neighboring private lands of the same character. When the existing rates were established, the users of the range understood that they would remain in effect

for five years, and many of the grazing permits were issued for this period. The value of the grazing privilege on many ranges subsequently advanced.

With reference to the increased rates for use of the range, no policy has been laid down by Congress for the guidance of the Department in the exercise of the administrative discretion, with which it has for fifteen years been vested, to determine the conditions under which the use of the range should be permitted. If Congress desires to prescribe such a policy, says Secretary Meredith, it should not take effect until after 1923, when the existing leases will expire.

BOOK PAPER FROM SOUTHERN PINE AND RED GUM

THE possibility of using southern pine and red gum for the production of high grade book and magazine paper has been demonstrated in recent trials at the United States Forest Products Laboratory, Madison, Wisconsin. Book paper requires for its manufacture two kinds of woods—a long-fibered wood, such as spruce, to impart strength, and some short-fibered hardwood to give the formation, finish, opacity, and other printing qualities. The southern

pinus are long-fibered woods, excellently suited for the manufacture of wrapping paper and fiber board, but their pitch content and the difficulty of bleaching them have heretofore been obstacles in the way of their use for white paper. These obstacles, it has been shown, can be overcome in a large measure by proper cooking conditions and improved bleaching methods. Red gum is typical of many southern hardwoods that might be used with the pines in the manufacture of the better grades of printing paper.

Additional information and samples of the paper made in the trial runs of pine and red gum may be obtained from the Forest Products Laboratory on request.

CLUB ENDORSES NATIONAL FORESTRY PROGRAM

AT a regular meeting of the Natural History Club of New York City, held in December, 1920, the club voted unanimously to endorse the National Forestry Program formulated at the meeting of the Wood Using Industries and the American Forestry Association on October 15, 1920, a printed copy of the Program being read to the club.

The Whole Country Is Now Voting For A National Tree

in the American Forestry Association's campaign of education. Every school is taking this up. Will you help the cause of Forestry by putting the magazine in one or more schools in your town? The teachers and the pupils need the magazine. Will you put it in their hands?

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Your old school or one near you will thank you for this.

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WILL YOU HELP?**

CLOSE FOREST UTILIZATION

A GROSS return of approximately \$500 per acre of forest land, compared with a return of less than \$300 an acre, had the timber thereon been cut for lumber alone, is given as an illustration of the results of close forest utilization by Howard F. Weiss, of the C. F. Burgess Laboratories, Madison, Wisconsin, in the last issue of the *Journal of Forestry*. Mr. Weiss bases his figures upon a survey made several years ago in the Pennsylvania forests. He says that the return to the lumber company cutting hemlock logs was \$288 per acre: \$45 per acre came from gathering four and one-half cords of hemlock bark; \$4 per acre or \$4 per cord was the return from using hemlock tops and culls for pulp; the mill waste was sold for both kindling and pulp with a return of \$25 per acre; the hardwoods on the tract were manufactured into staves at \$6 a thousand for the 13,000 per acre obtained, or \$78, and about \$48 per acre came from cutting the small and defective hardwood waste into "chemical wood" at a return of \$4 per cord.

FARM BUREAU ORGANIZES FORESTRY DEPARTMENT

THE Michigan State Farm Bureau at Lansing, Michigan, has made a unique move in organizing a forestry department as one of the eleven departments in the development of its educational work for the benefit of the 98,000 farmers of Michigan. Some of the more important phases to be extended to the farmers of the State who produce wood products are the conduct of State wide marketing pools of farm timber products, such as fence posts, fuel, retort wood, etc., the marketing of maple syrup for Michigan makers, the stimulation of the use and improvement of the marketing and of forest tree nuts and seeds. A cruising service is also to be extended to small woodland owners, together with working plans for the encouragement of the "annual crop" idea, the timber thus remaining in the ownership of the farmer.

LUMBER FOR SEWING MACHINES

ABOUT 60 million feet of lumber are used annually in the manufacture of sewing machines. Oak and red gum each supply nearly one-third of this lumber, and yellow poplar and black walnut each a little more than one-eighth, the balance being made up of tupelo, chestnut, cottonwood, maple, basswood, birch, sycamore, mahogany, yellow pine and redwood. Tops of sewing machines are usually made of hardwood veneers such as oak or walnut, or of other woods stained to imitate mahogany. The sewing machine industry is centered largely in Indiana and Illinois.

FOREST SCHOOL NOTES**UNIVERSITY OF LOUISIANA
SUMMER FOREST SCHOOL**

PROFESSOR J. G. LEE, of the chair of forestry at the State University, and a member of the board, fathered the inauguration of a Summer School of Forestry for advanced pupils at the university and others, with the advantage of practical experience in the woods at Uria in La Salle County, and at Bogalusa, where is located the world's largest lumber mill. This school will be conducted in conjunction with the State University School of Forestry.

The idea of the boys' forestry clubs so appealed to Colonel W. H. Sullivan, of the Great Southern Lumber Company, that he agreed to offer prizes next year of \$500 for the best results and demonstrations in forestry achieved by boys. The suggestion was heartily endorsed by Commissioner Alexander.

**UNIVERSITY OF IDAHO
SCHOOL OF FORESTRY**

THIS year the Idaho School of Forestry is offering a special vocational course to meet the needs of disabled soldiers receiving federal training under the Rehabilitation Act. The curriculum is divided into quarterly units and the work is arranged so that each unit is practically independent, thus permitting students to enter at the beginning of any quarter and take up the work without being dependent upon the previous units. In order to facilitate the instruction, these units are so arranged that the terms of the Ranger Course correspond with the units of the Vocational Course, thus making it possible to handle the two classes together.

**COMPULSORY FIRE PREVENTION
EDUCATION**

THE Forest Service of the United States Department of Agriculture is preparing to give active co-operation to a measure undertaken by the Fire Marshals' Association of North America to bring about legislation for compulsory fire prevention education in the States whose legislatures convene this winter, according to a bulletin sent out by the National Board of Fire Underwriters. This is a highly important development in the educational field and should receive the hearty support of public-spirited people everywhere, as it not only concerns the public safety, but is intimately connected with the preservation of our forests from destruction by fire.

BOX MAKING IN NEW ENGLAND

NOT less than \$50,000,000 worth of wooden boxes are manufactured in New England each year by the 210 establishments engaged in the business. The lumber used by the box factories amounts to 670,000,000 feet. About 6,000 men are employed in the factories.

At present paper manufacturers are offering prices for lumber that makes it difficult for box manufacturers to secure material. The sawmills of northern New England are closing because the paper manufacturers will pay more for the logs in the water than can be obtained for the sawed boards.

The box business is one which touches all other industries and upon which nearly all are more or less dependent. New England was first in the field and has always done a lion's share of box manufacturing, drawing upon the forests of Maine, New Hampshire and Massachusetts for the lumber and looking to the neighboring manufacturers for a market. The manufacture of boxes is as old as civilization. The Egyptians made mummy cases of wood smeared with bitumen. Some of these gruesome cases, 6000 years old, are still in existence.

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